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**VORTEX SHEDDING BY BLUNT/BLUFF BODIES AT
HIGH REYNOLDS NUMBERS**

**Volume III of IV
Cubes**

B. R. Merrill

March 1993



Final Report

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93-09620



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**PHILLIPS LABORATORY
Directorate of Plans and Programs
AIR FORCE MATERIEL COMMAND
KIRTLAND AIR FORCE BASE, NM 87117-5776**

This final report was prepared by the Phillips Laboratory, Kirtland Air Force Base, New Mexico, under Job Order 9993XX21. The Laboratory Project Officer-in-Charge was Bruce R. Merrill (XPXS).

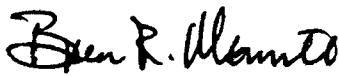
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This report has been reviewed and is approved for publication.


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REPORT DOCUMENTATION PAGE

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13. ABSTRACT (Maximum 200 words) This report documents the analysis of vortex shedding data collected by the Phillips Laboratory at the U.S. Air Force Academy Subsonic Wind Tunnel facility. The analysis is primarily of the power spectrum of the vortex shedding as seen in the force and moment coefficient power spectra. The shedding frequencies as seen in the power spectra are used to analyze for the Strouhal number. The analysis suggests that shape and orientation in the wind field have an effect on the shedding of vortices.			
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EXHIBIT 3

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DATA REPORT

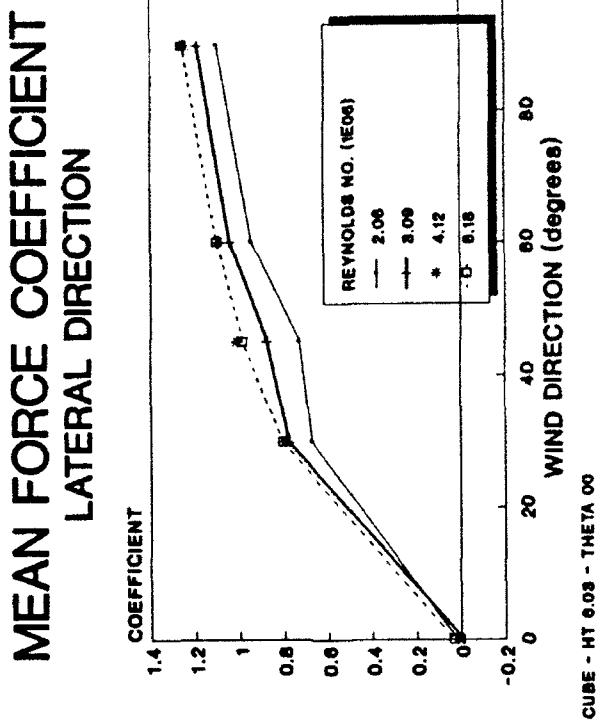
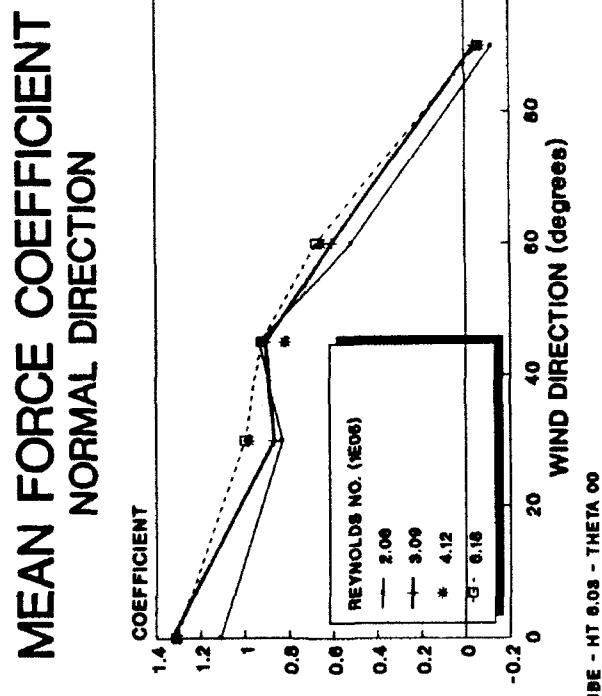
SHAPE:	CUBE
DECLINATION [THETA (degrees)]:	0
DIMENSIONS [LxWxH (in)]:	7.64 x 7.9 x 6.03
WEIGHT (gm):	735.5
TORSION FREQUENCY (Hz):	45
LATERAL (SIDE BEND) FREQUENCY (Hz):	89
NORMAL (AFT BEND) FREQUENCY (Hz):	83
AZIMUTHS (degrees):	0, 30, 45, 60, 90

GRAPH CORRECTIONS:

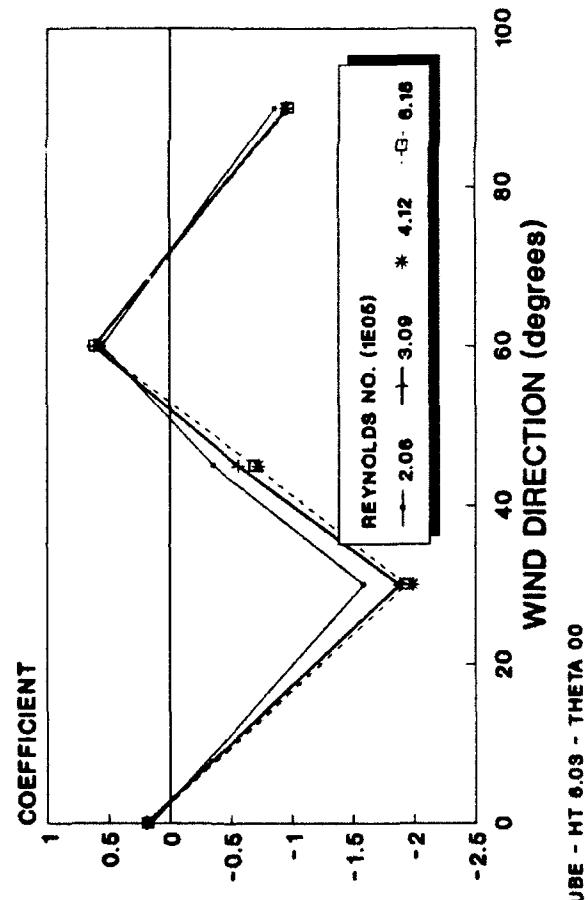
- The mean value of the **ROLL** moment coefficients should be divided by 12.
- The PSD and PSD Integral values of the **ROLL** moment coefficients should be divided by 144.

OBSERVATIONS:

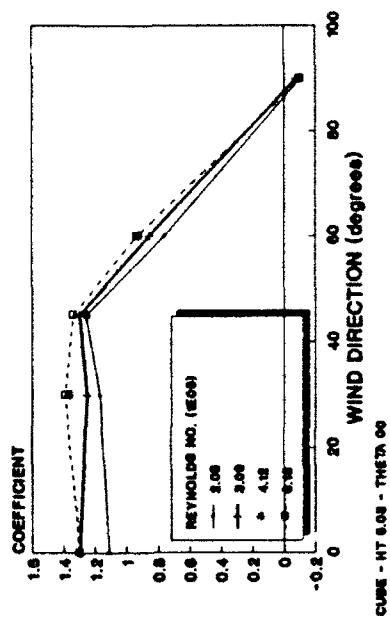
- A very good shed is observed in the lateral data at 0 degrees azimuth. The shed is largely single frequency in nature.
- A very good shed is observed in the normal data at 90 degrees azimuth. This shed is partially seen in the roll data as well. This shed is more multifrequency in nature.
- 15.176 Hz spike is seen in the normal force data. The spike is not always as prominent in the normal moment data which suggests a lack of coherence in the 15.176 Hz spike.



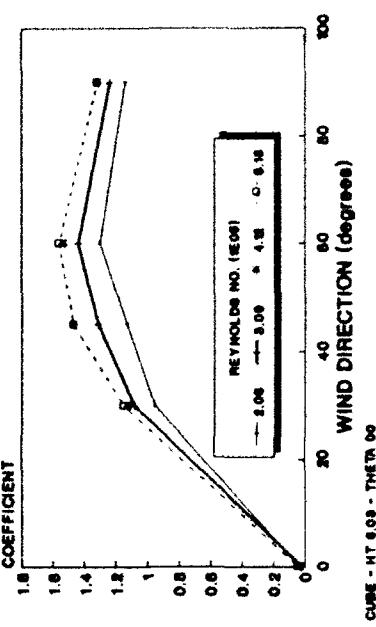
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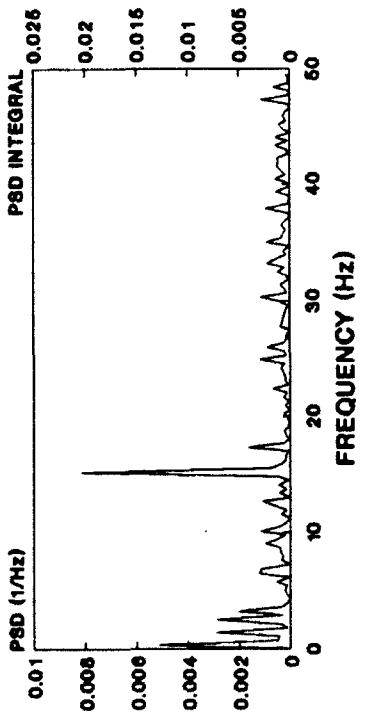
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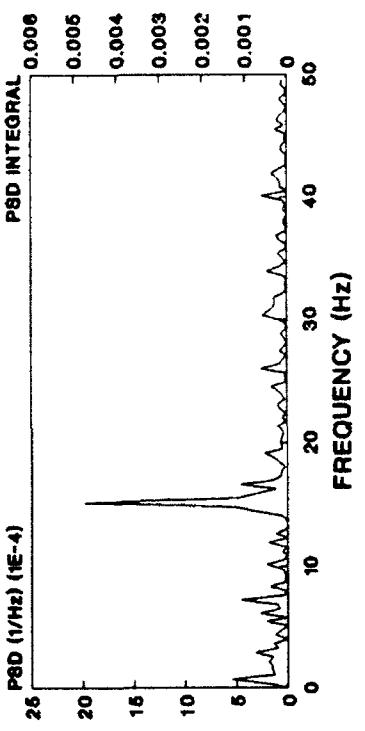
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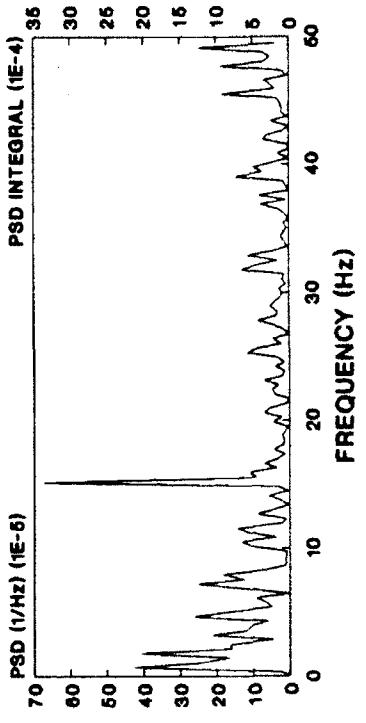
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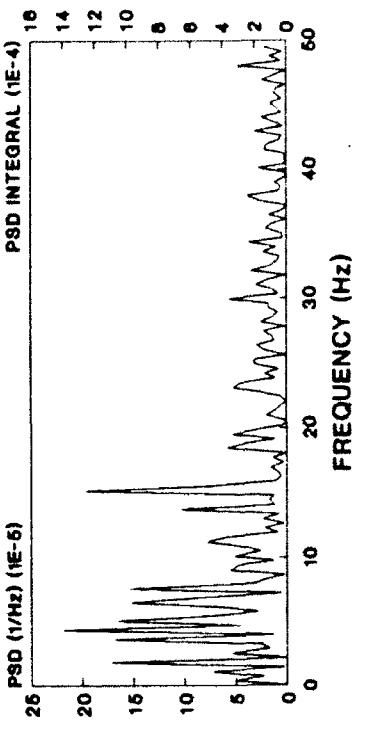
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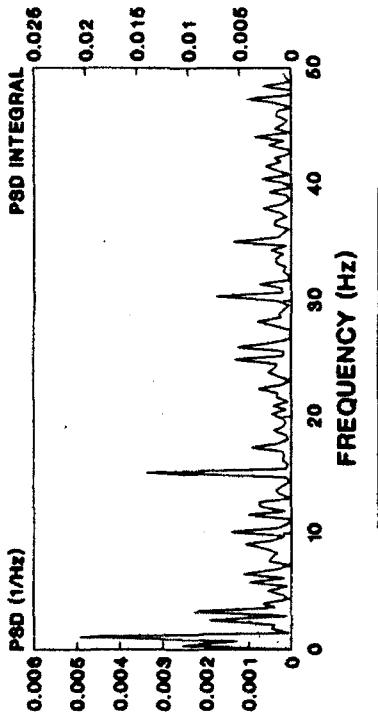
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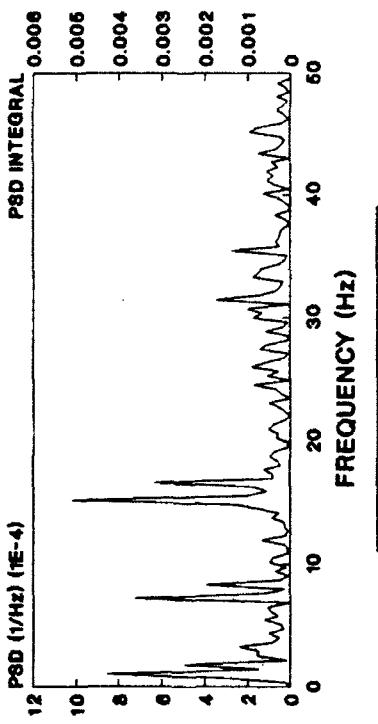
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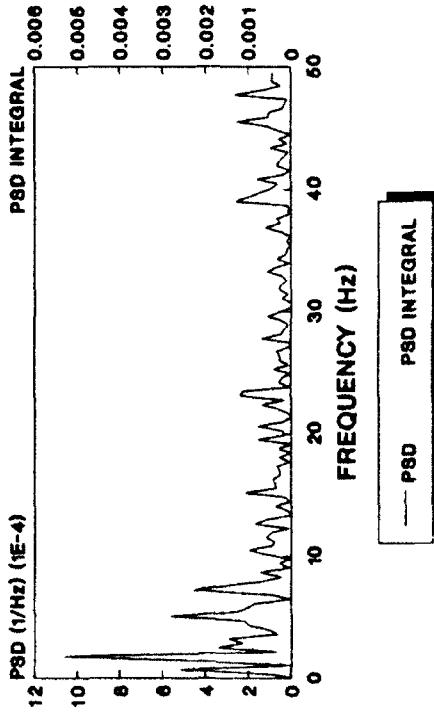
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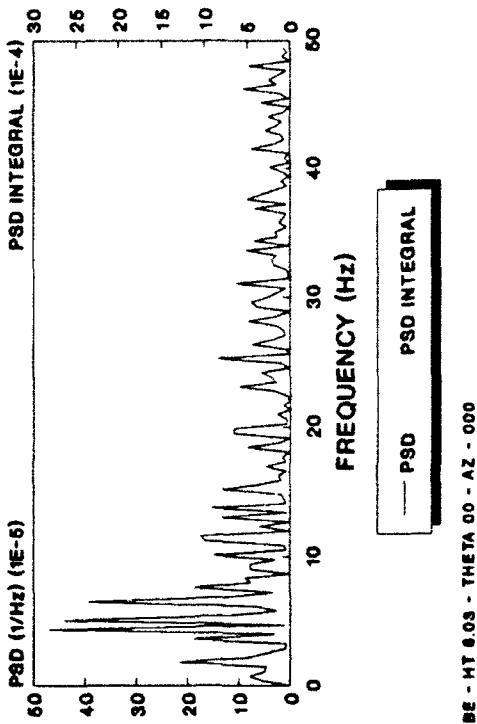
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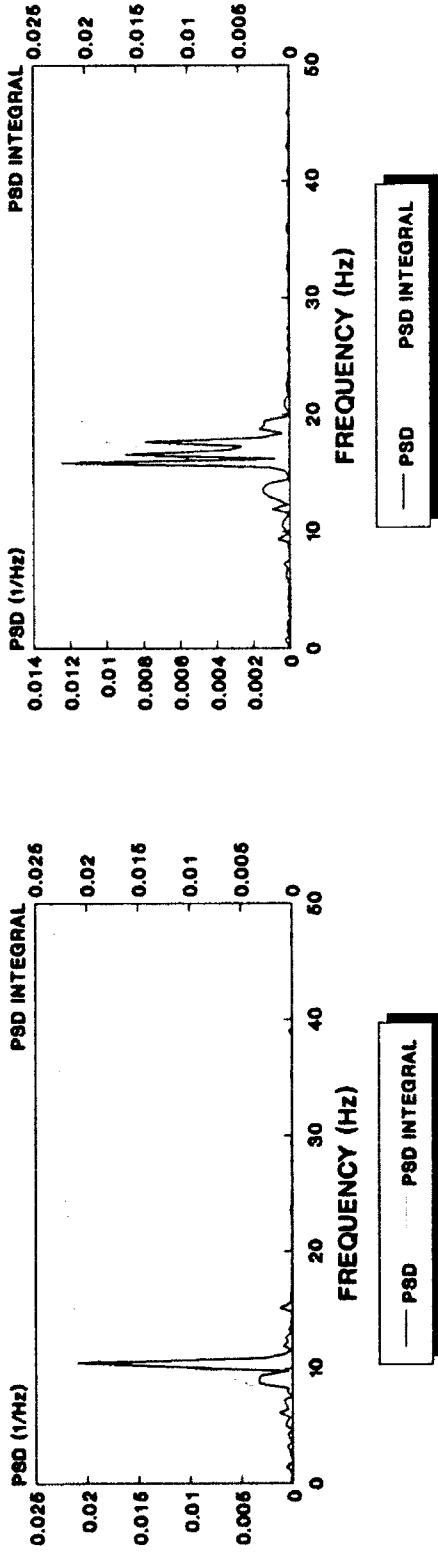
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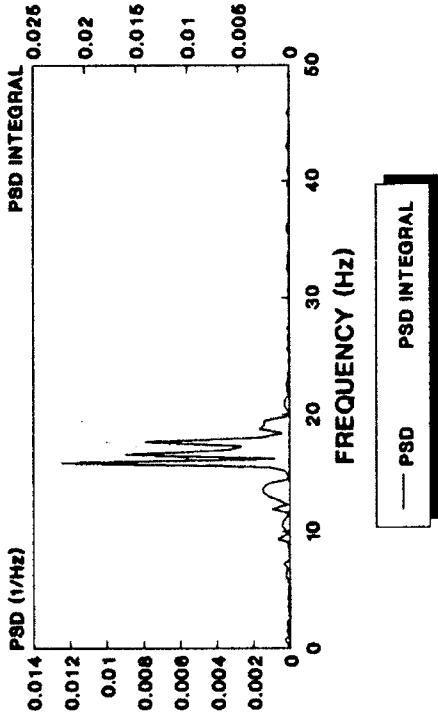
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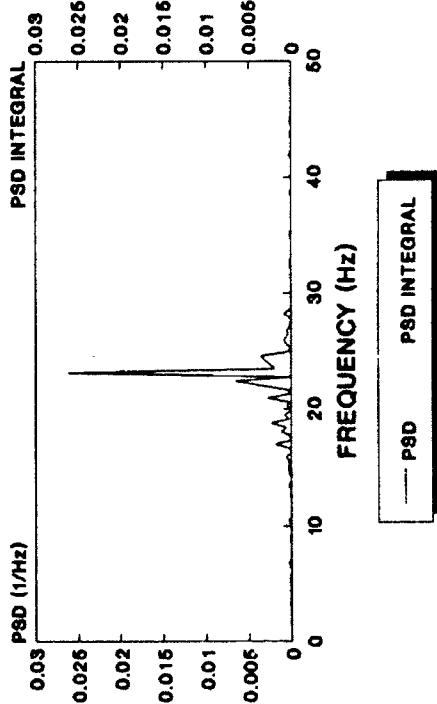
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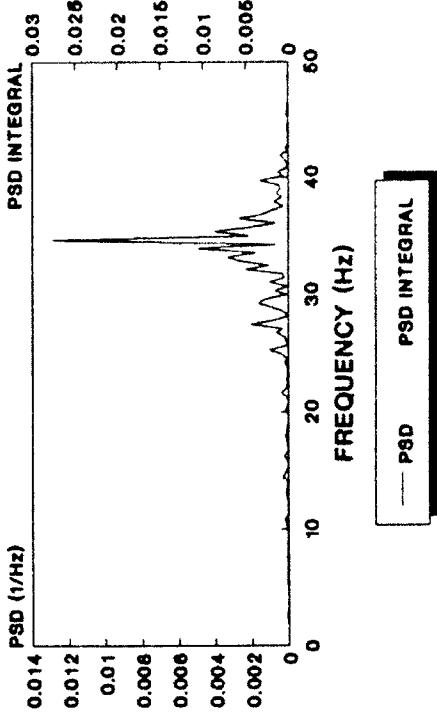
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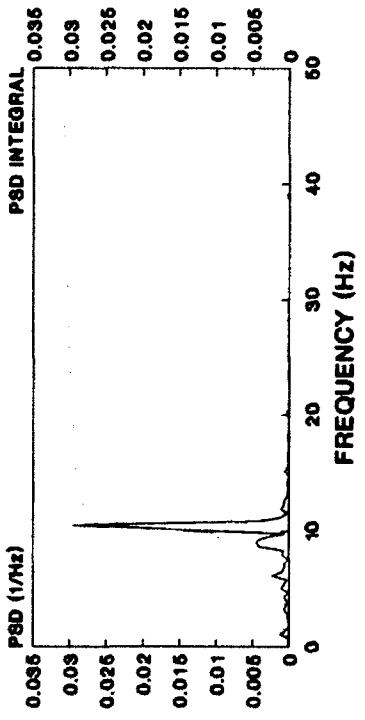
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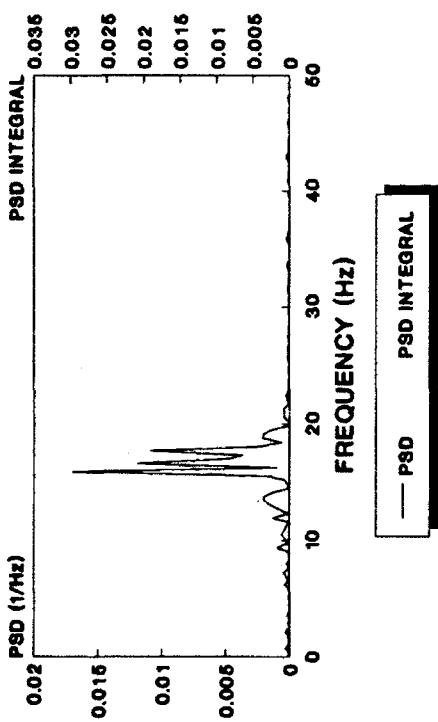


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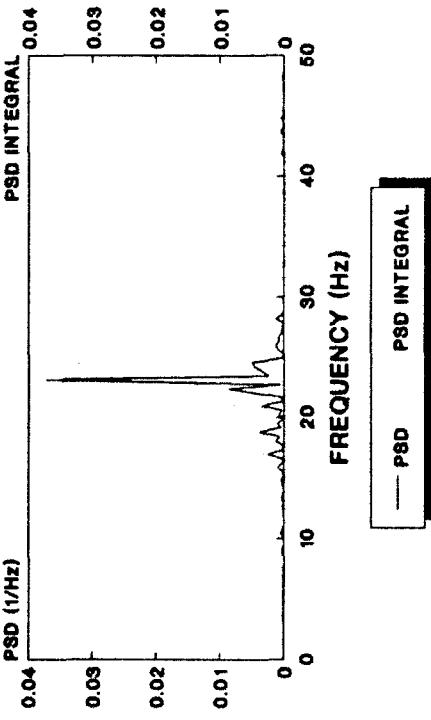
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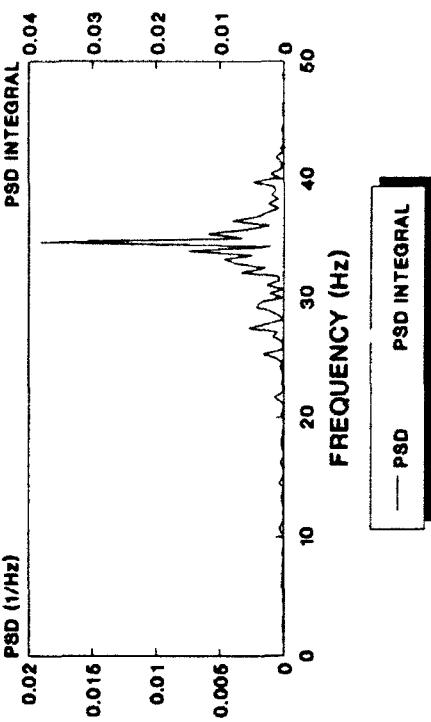
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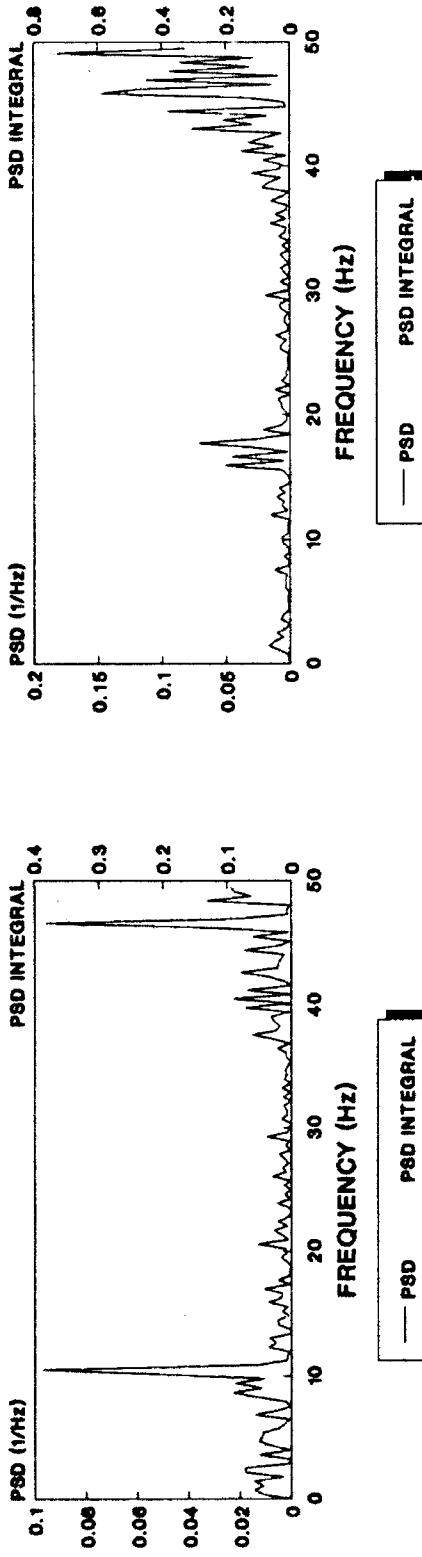
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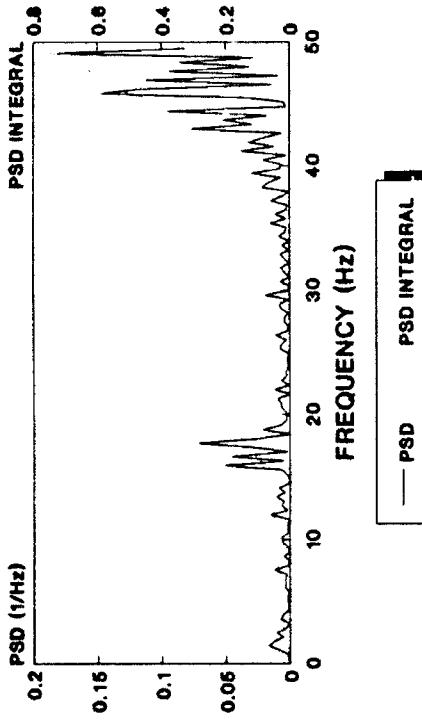


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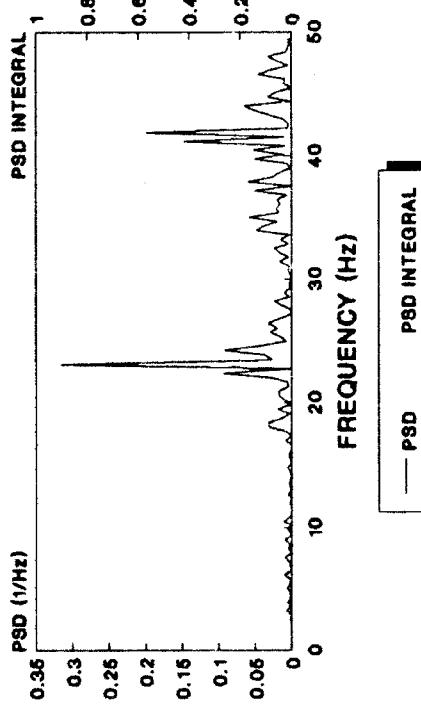
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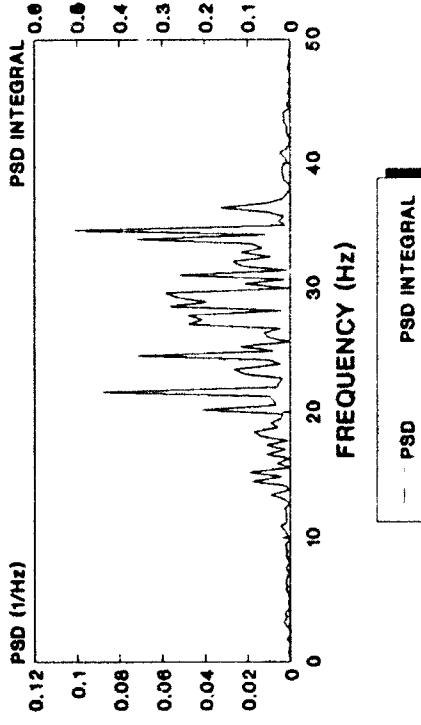
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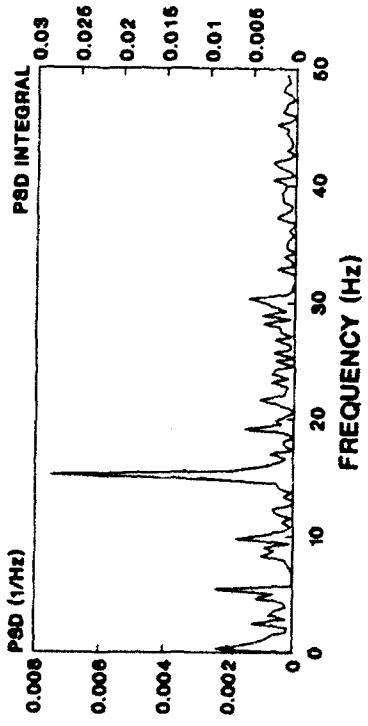
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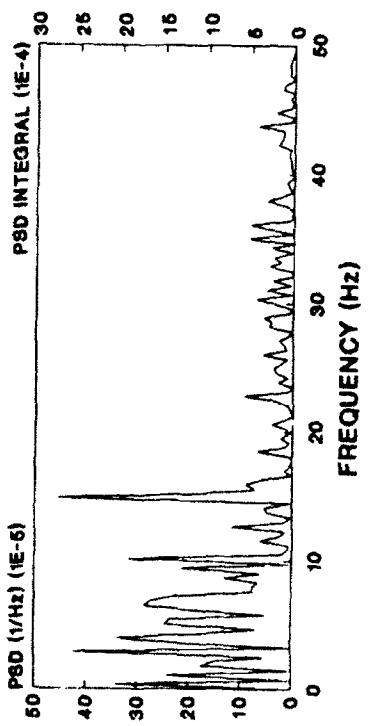


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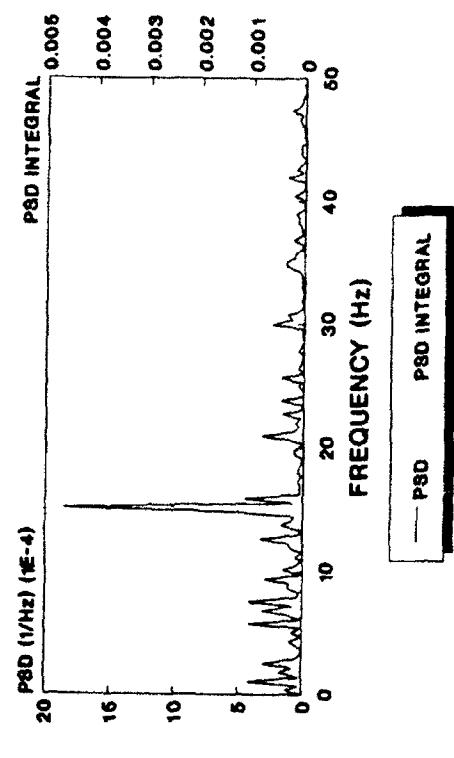
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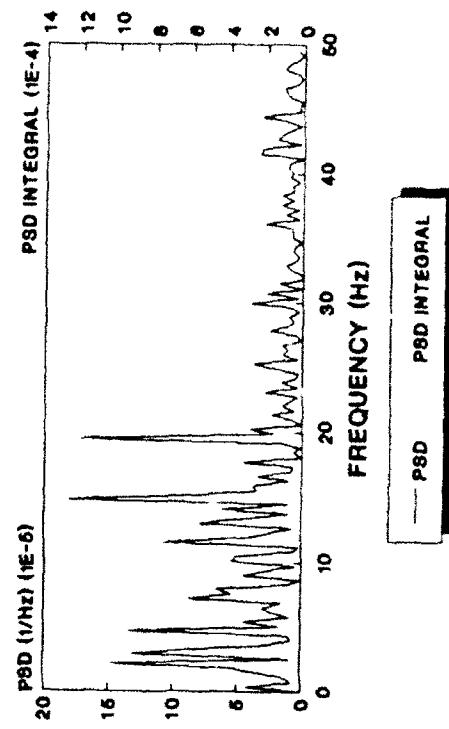
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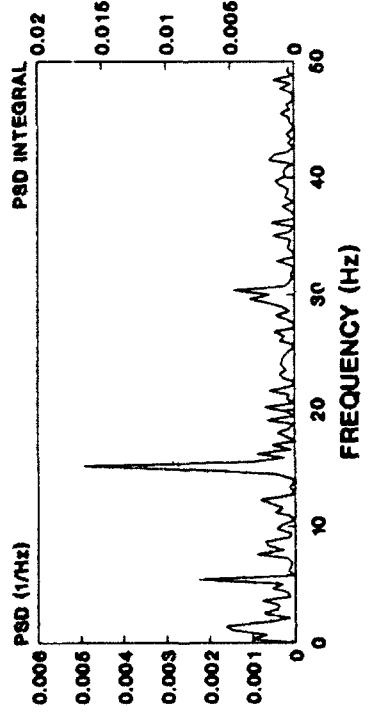
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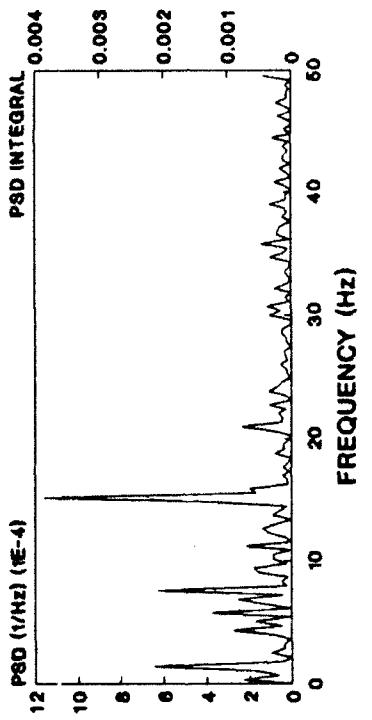


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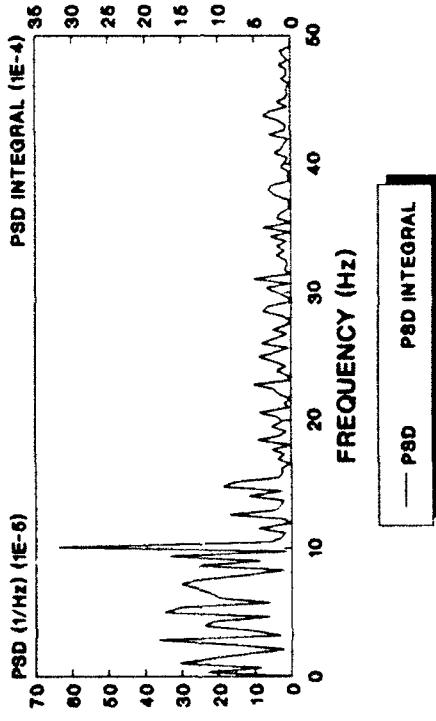
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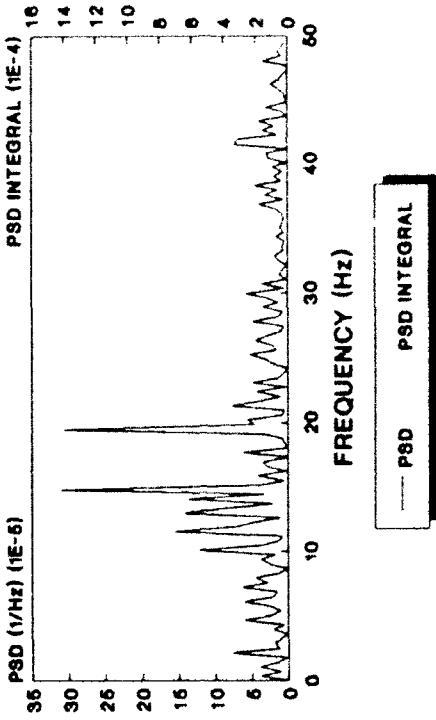
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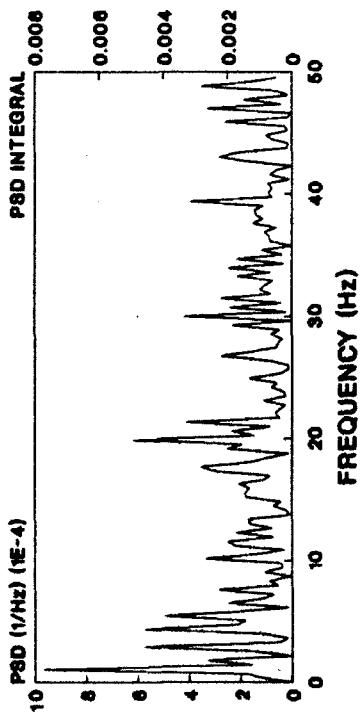
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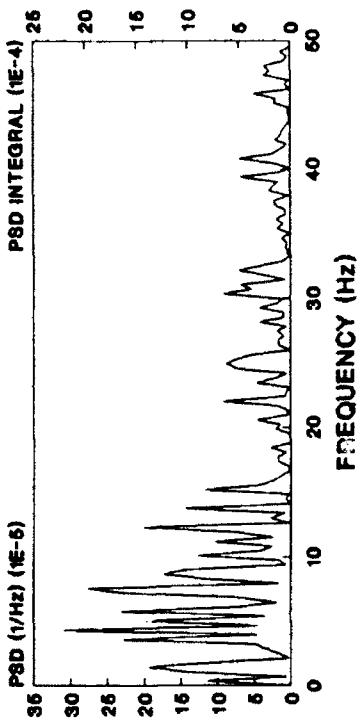
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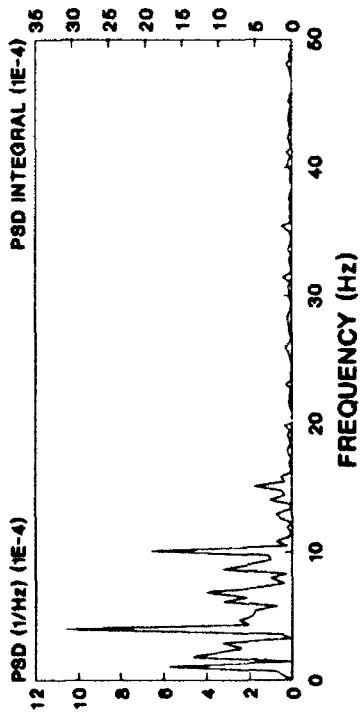
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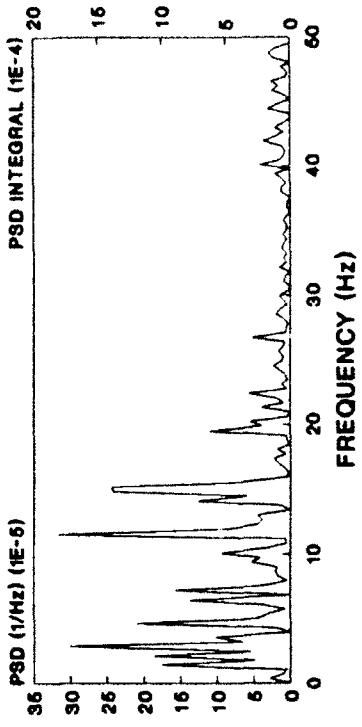
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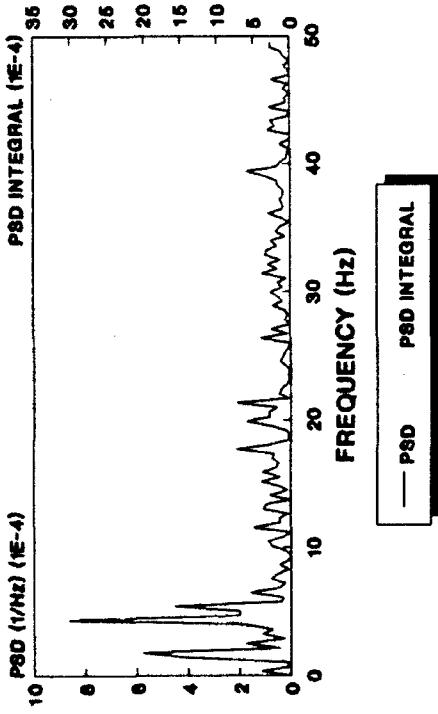
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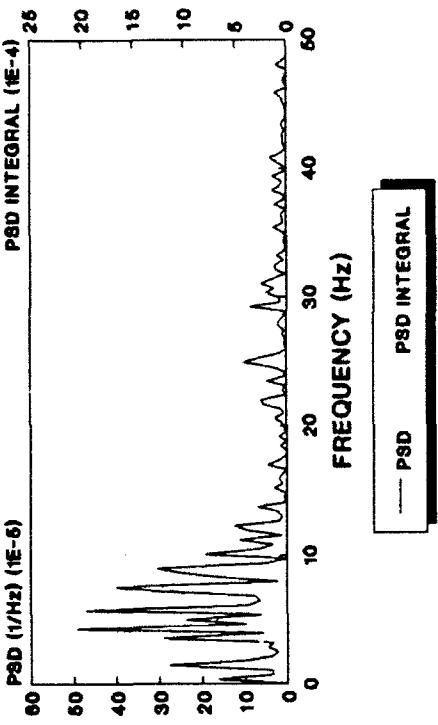
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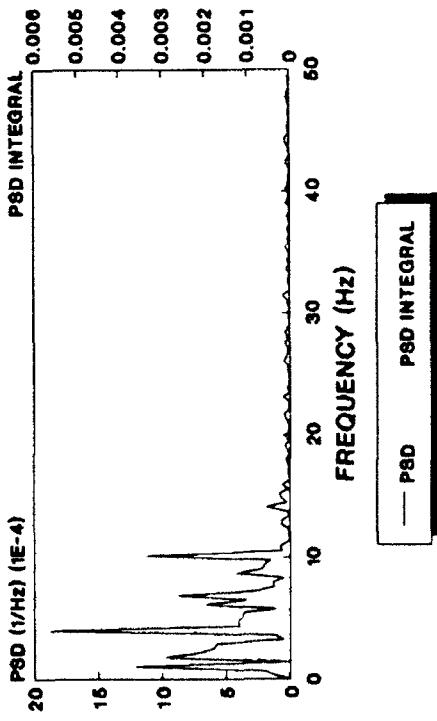
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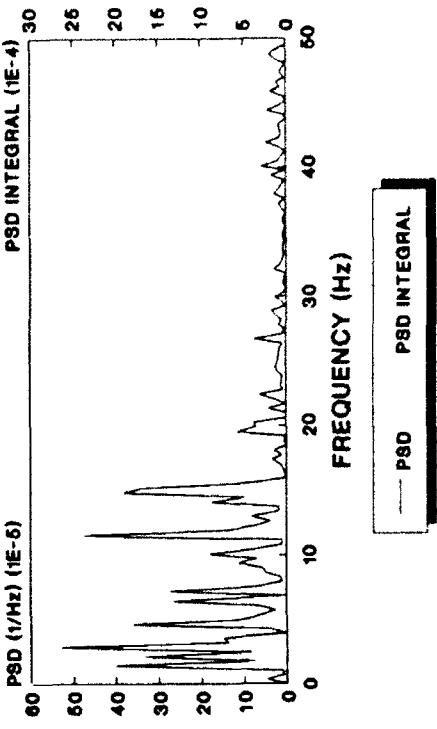
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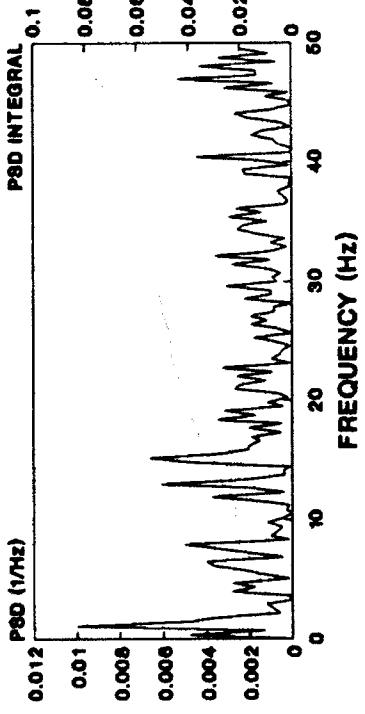
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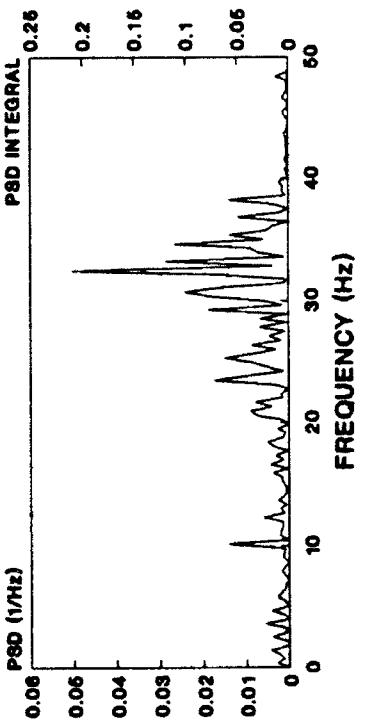
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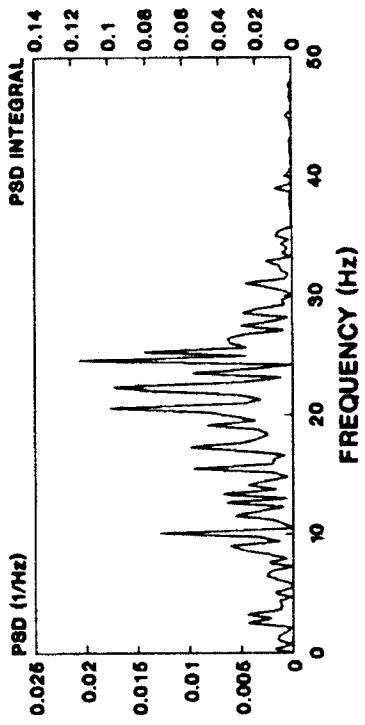
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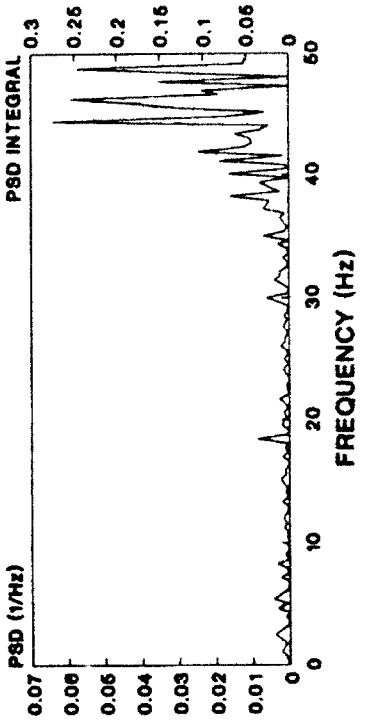
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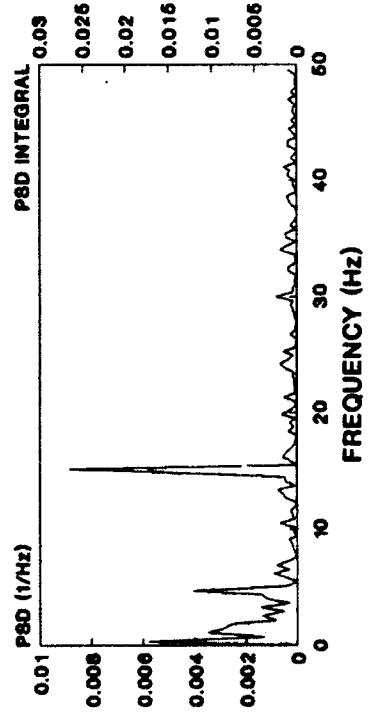
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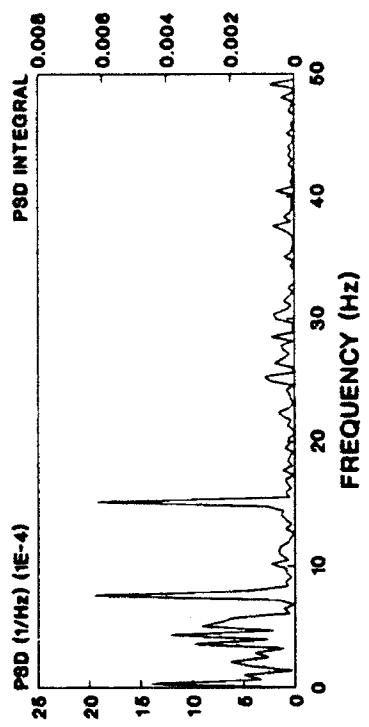
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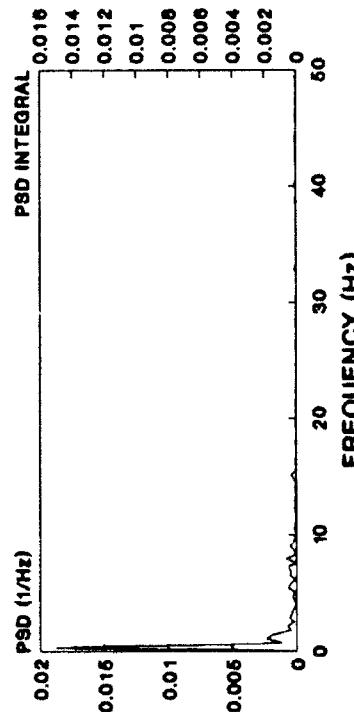
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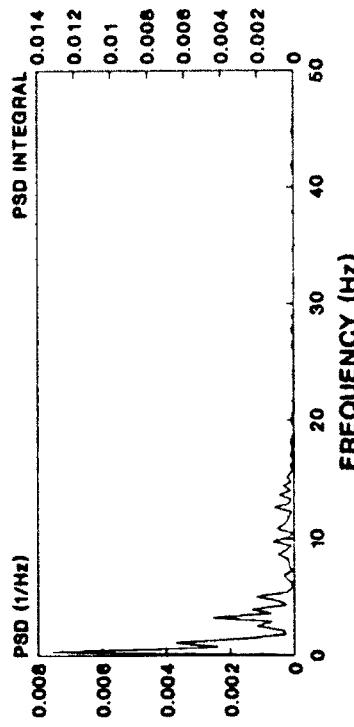
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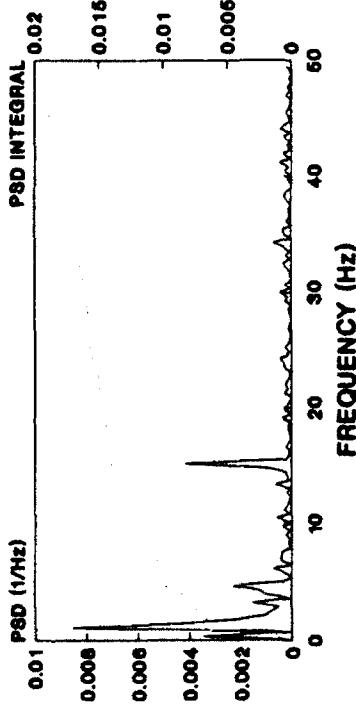
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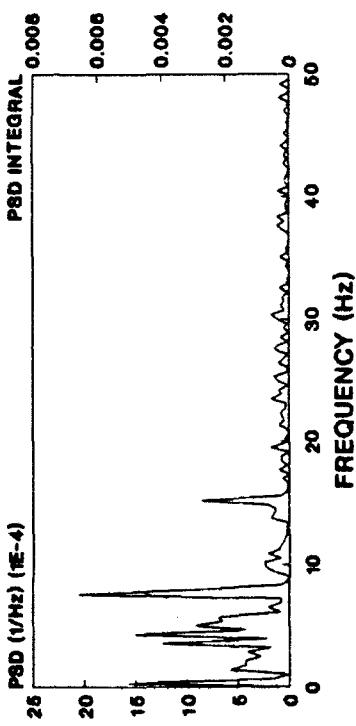
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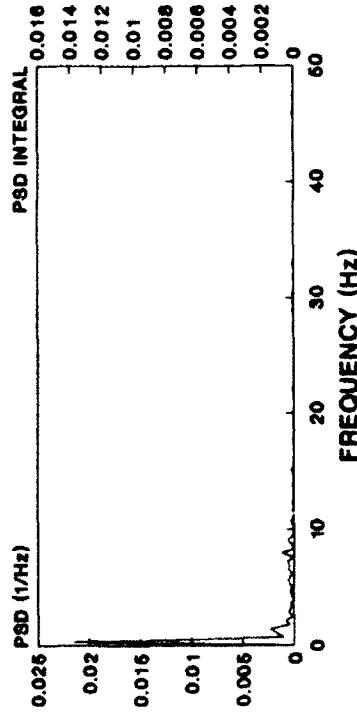
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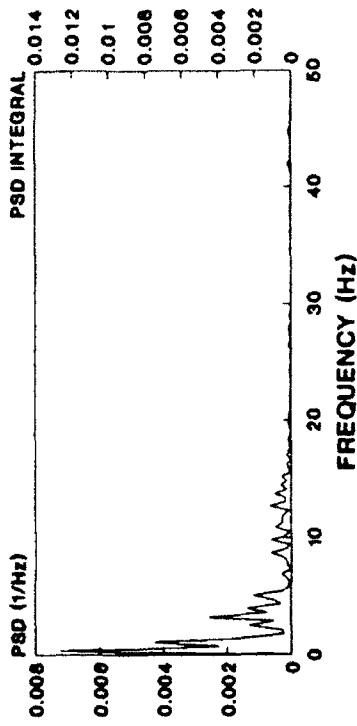
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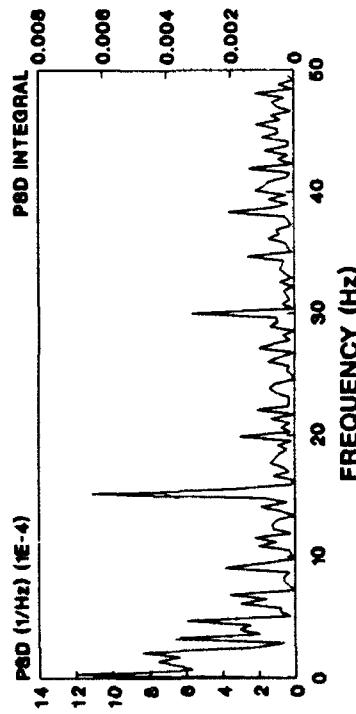
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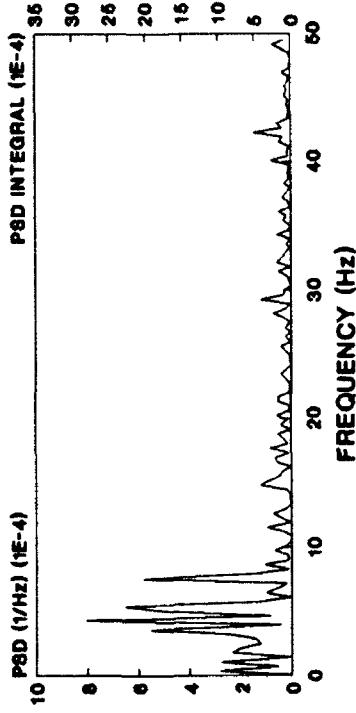
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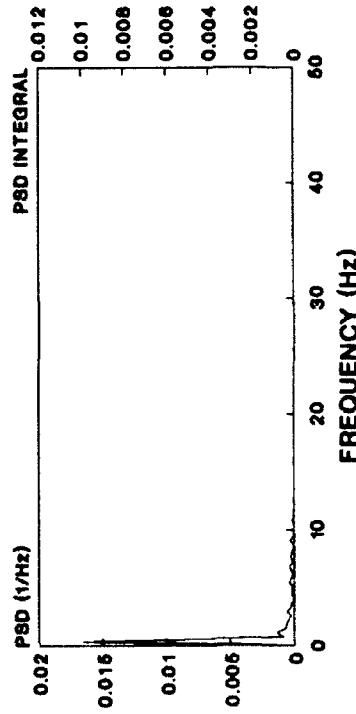
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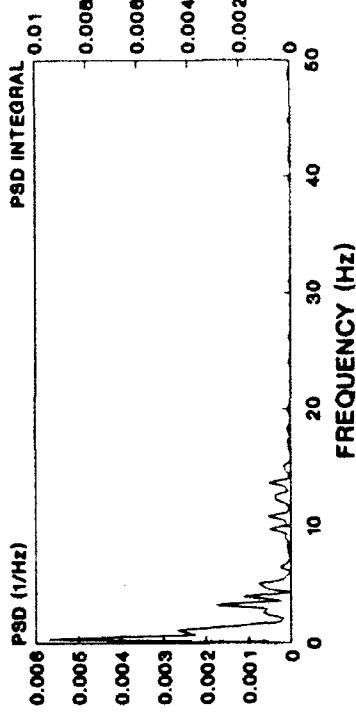
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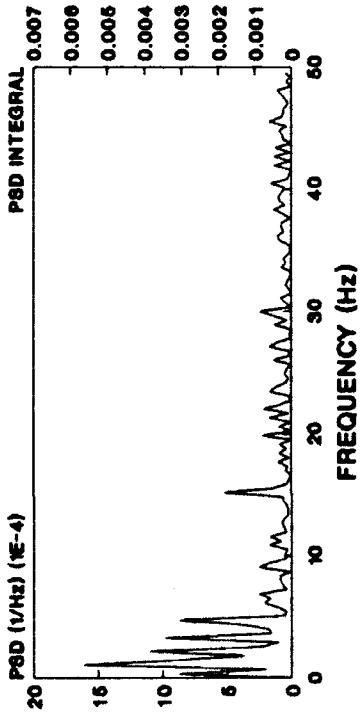
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



FORCE COEFF - LATERAL 180 FT/SEC NOMINAL

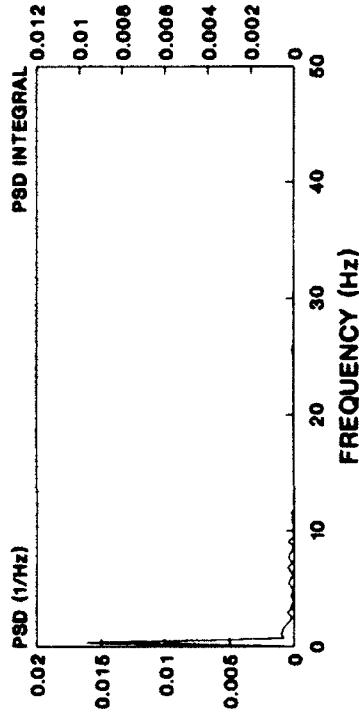


MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



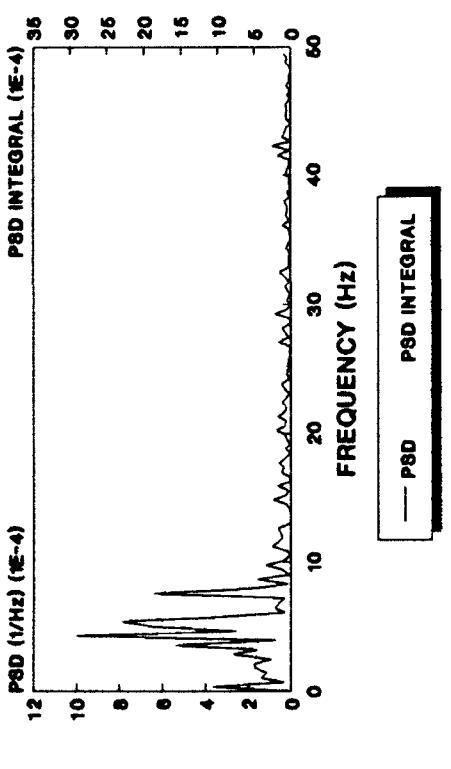
CUBE - HT 6.03 - THETA 00 - AZ 045

MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



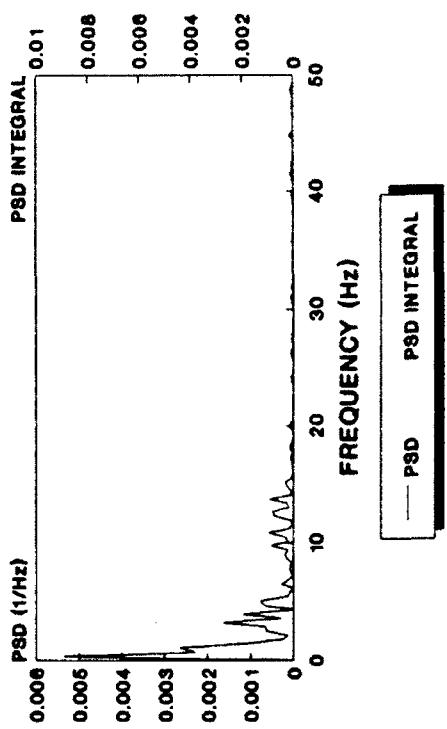
CUBE - HT 6.03 - THETA 00 - AZ 045

MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



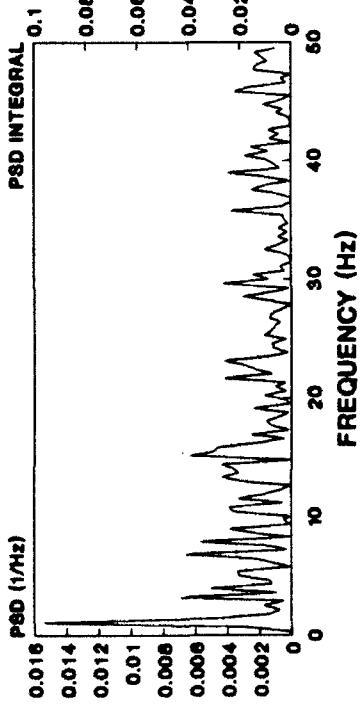
CUBE - HT 6.03 - THETA 00 - AZ 045

MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL

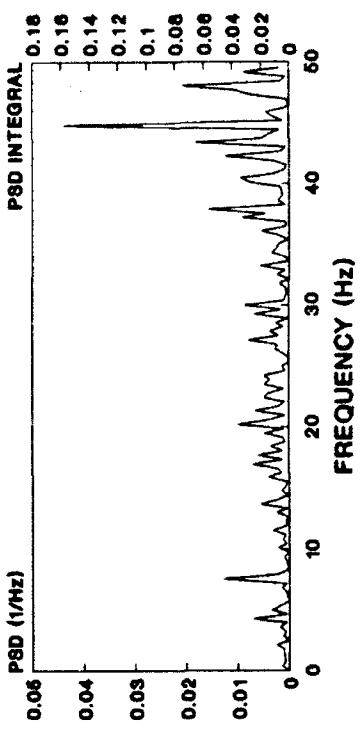


CUBE - HT 6.03 - THETA 00 - AZ 045

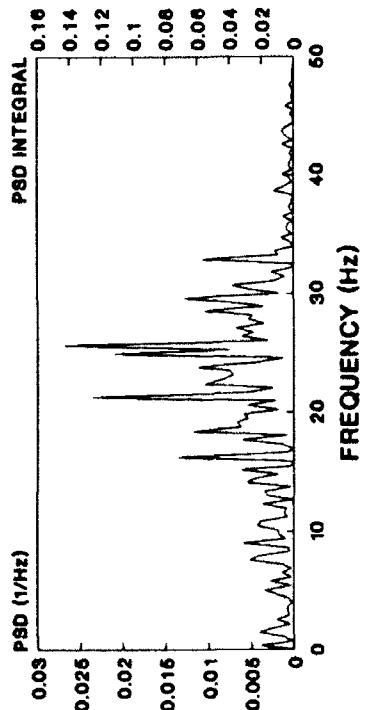
MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



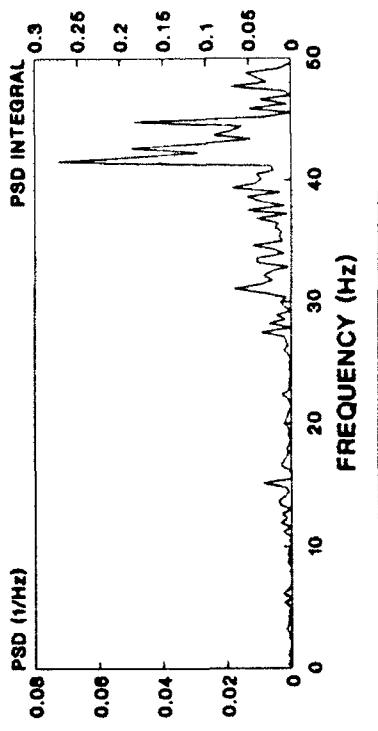
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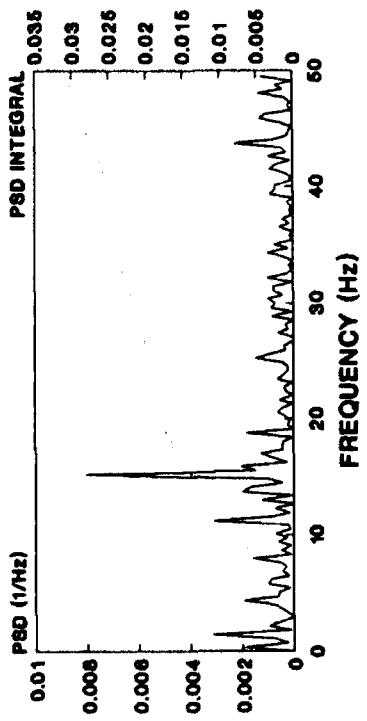
MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



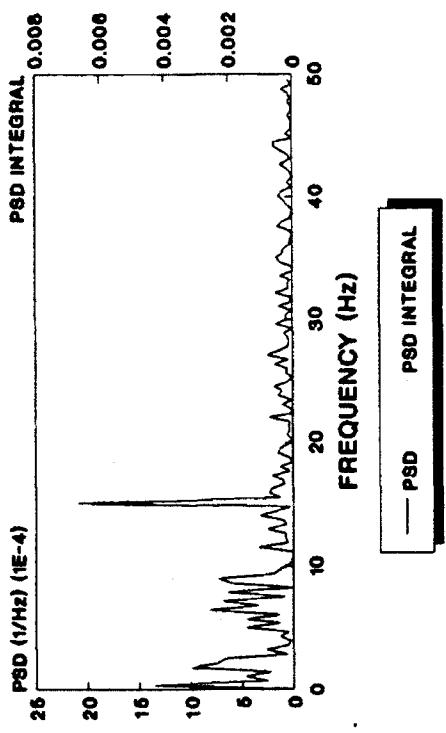
MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



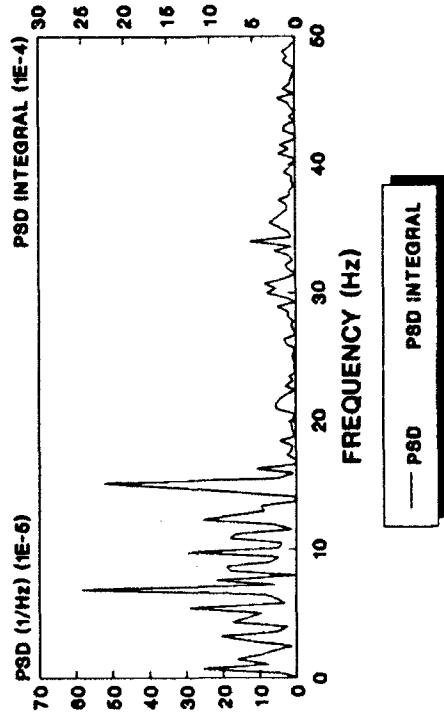
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



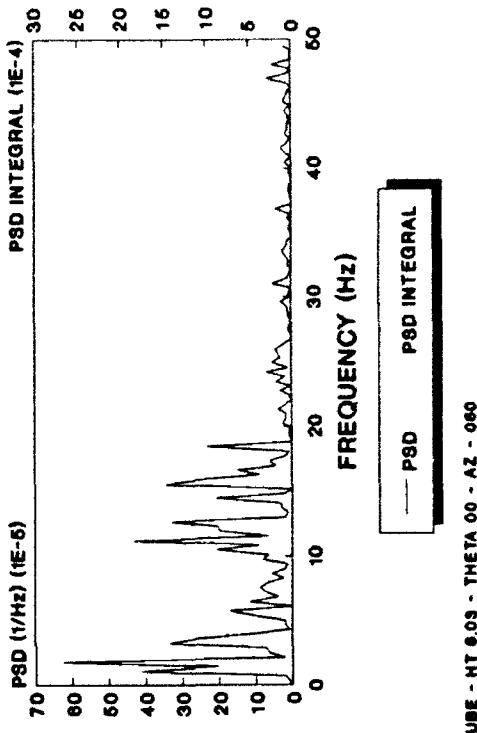
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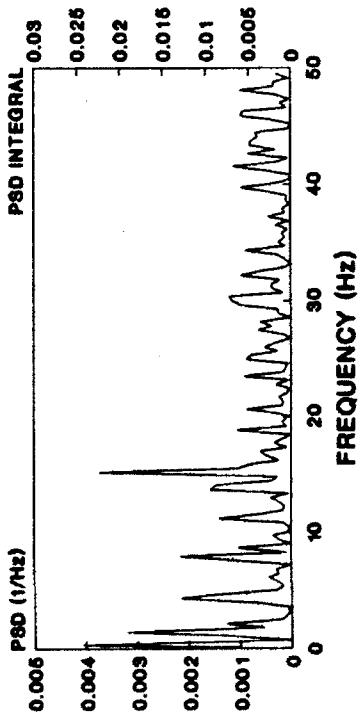
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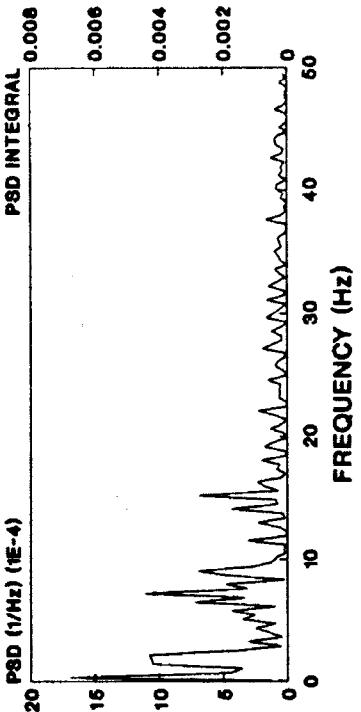
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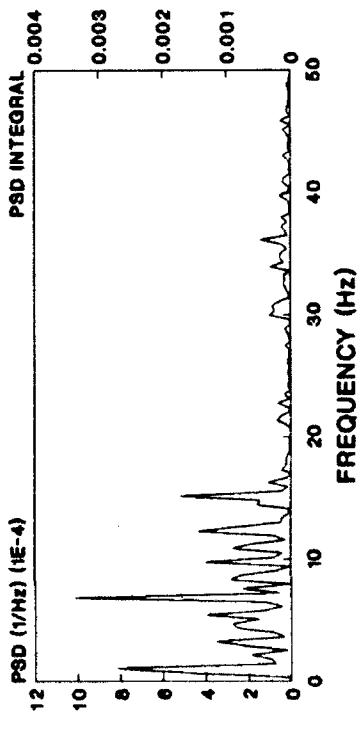
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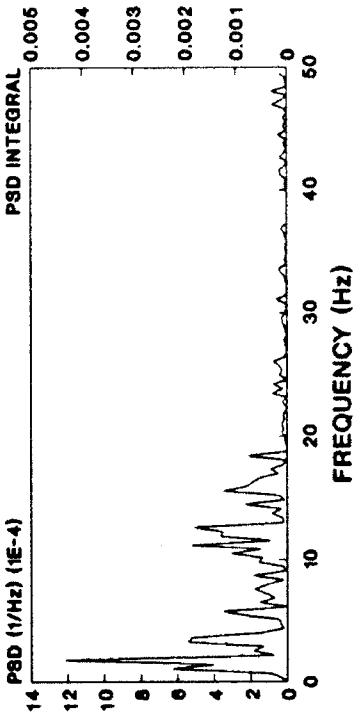
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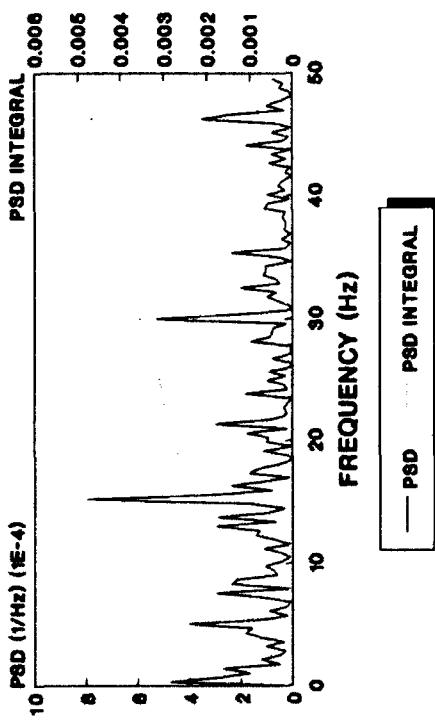
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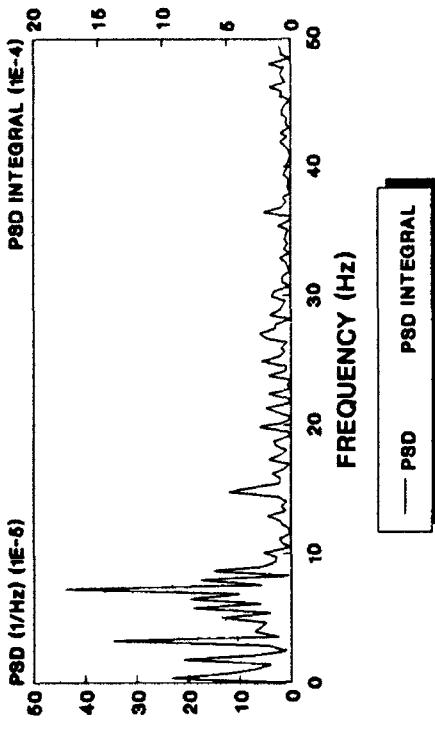
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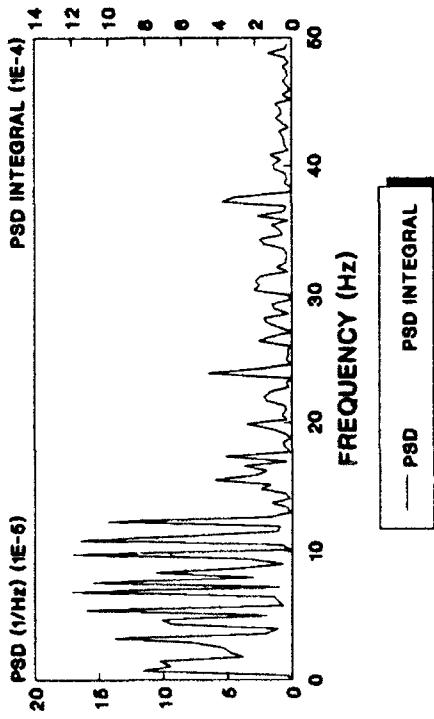
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



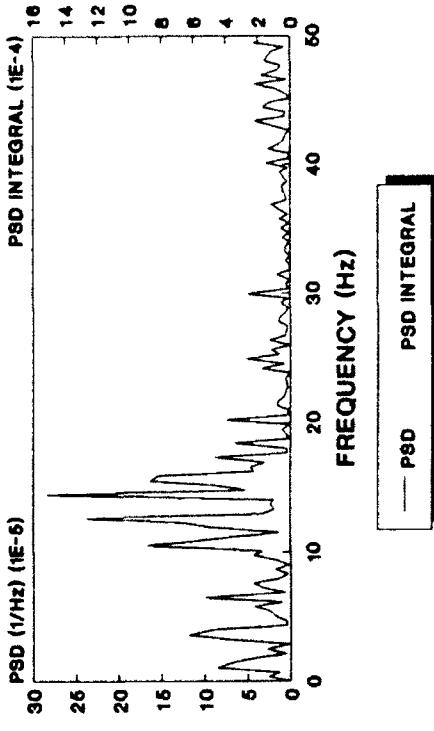
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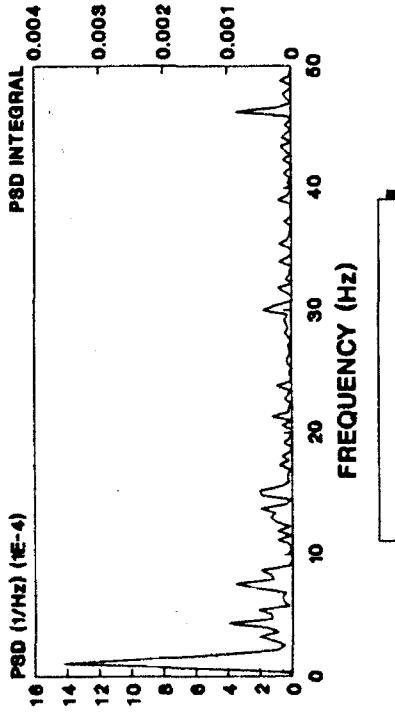
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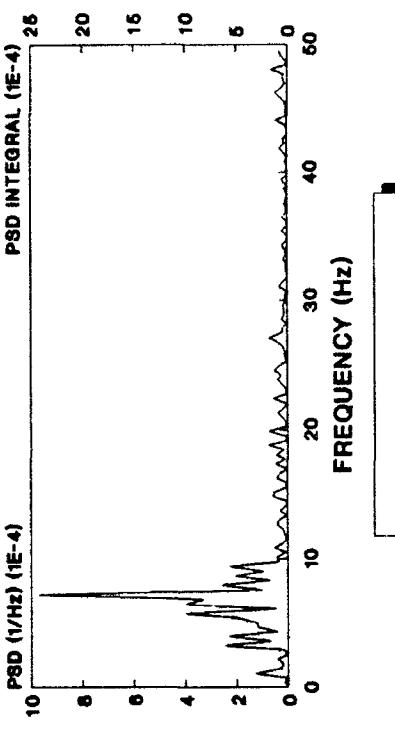
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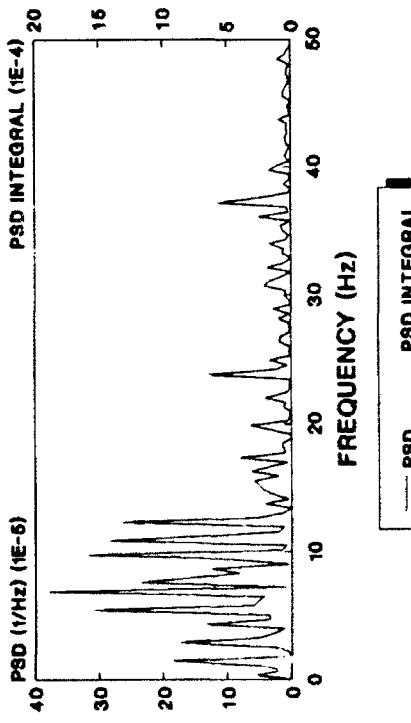
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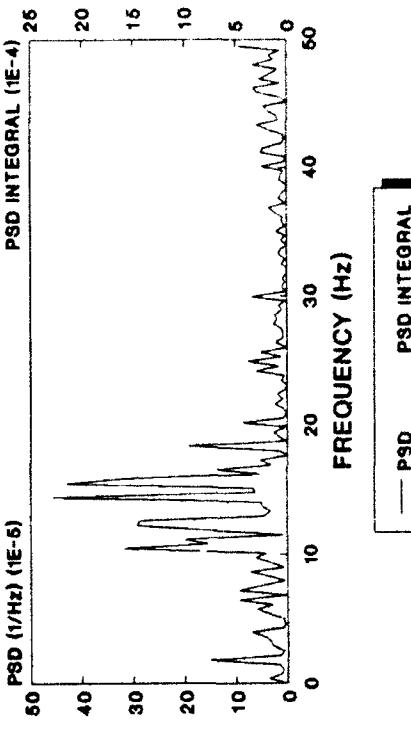
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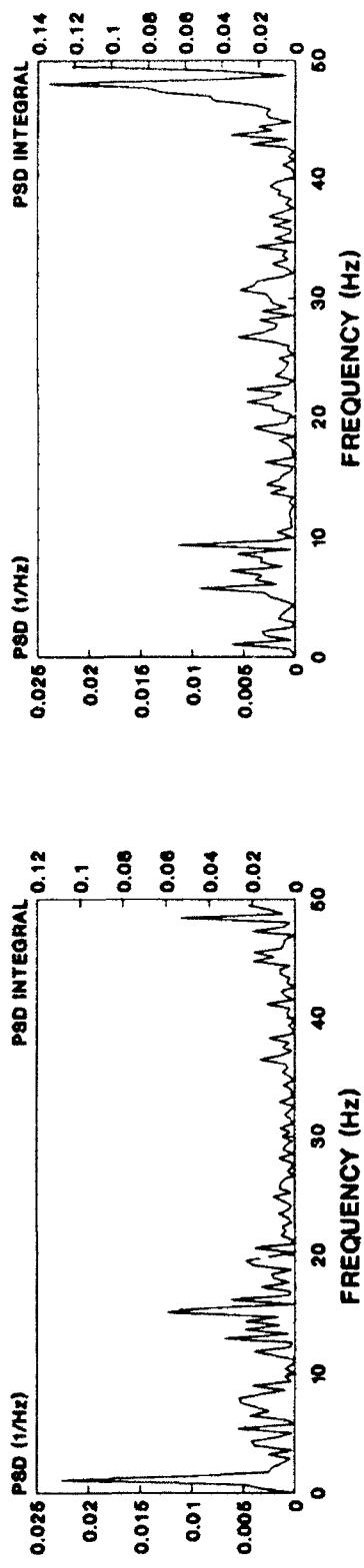
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



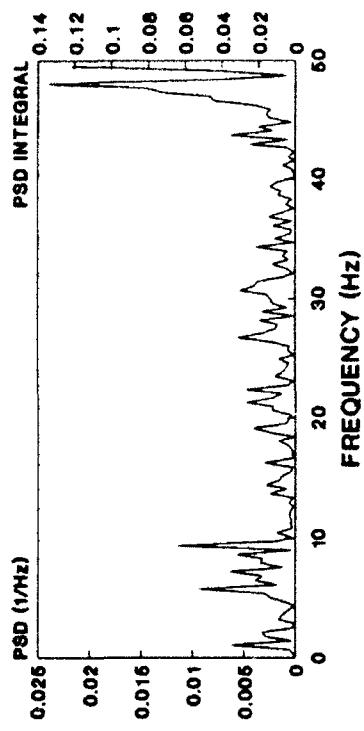
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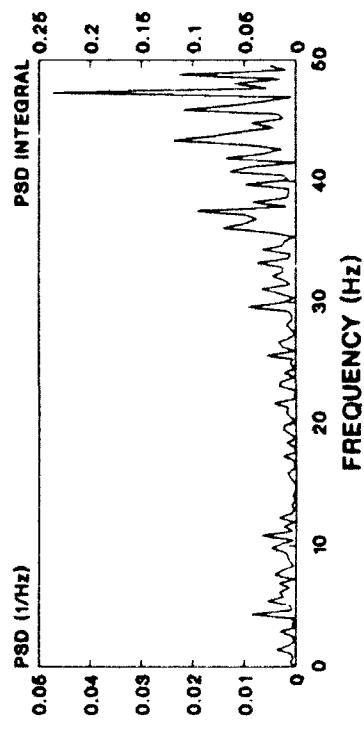
MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



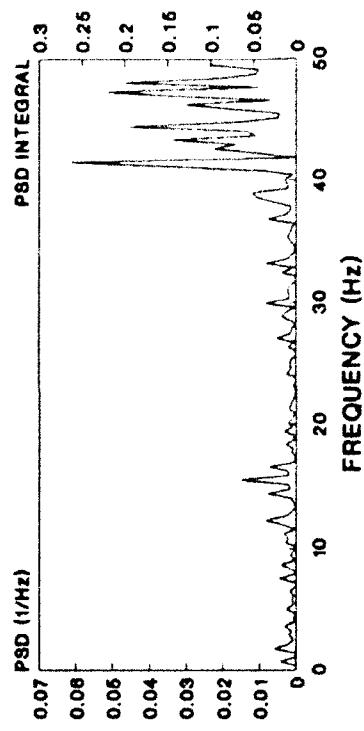
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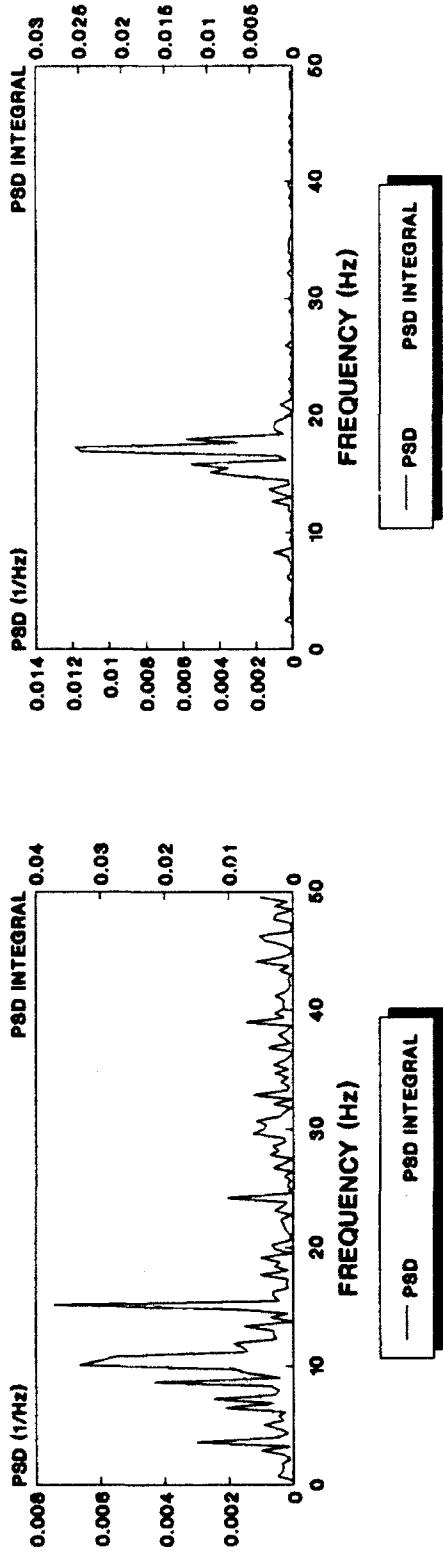
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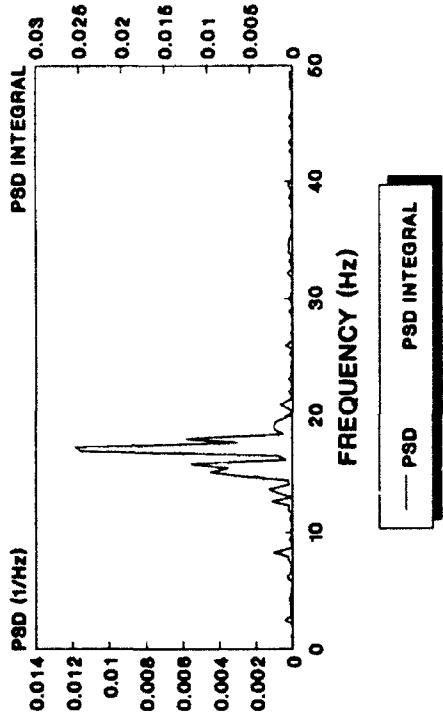
MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



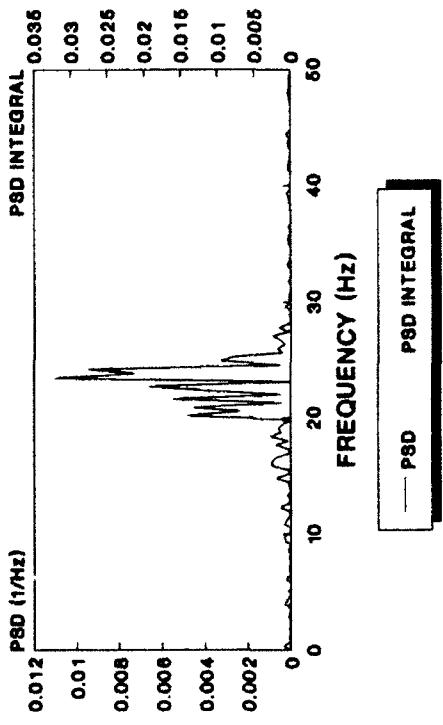
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



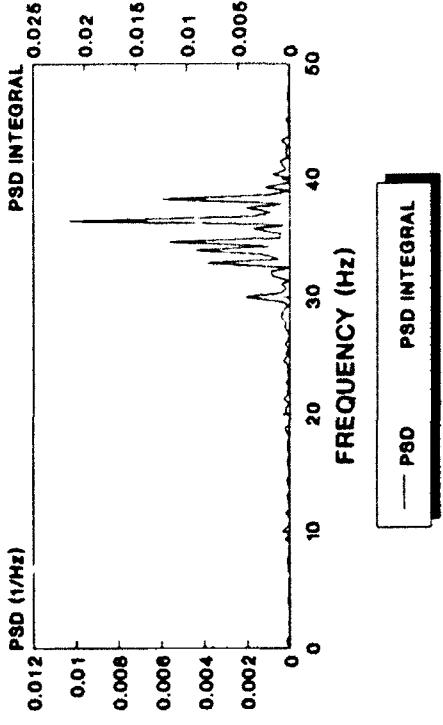
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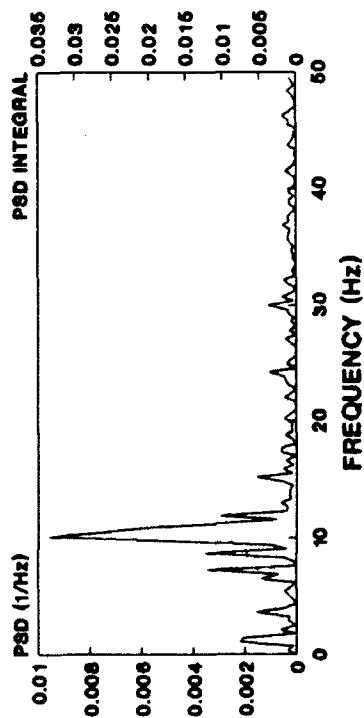
FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



FORCE COEFF - NORMAL 180 FT/SEC NOMINAL

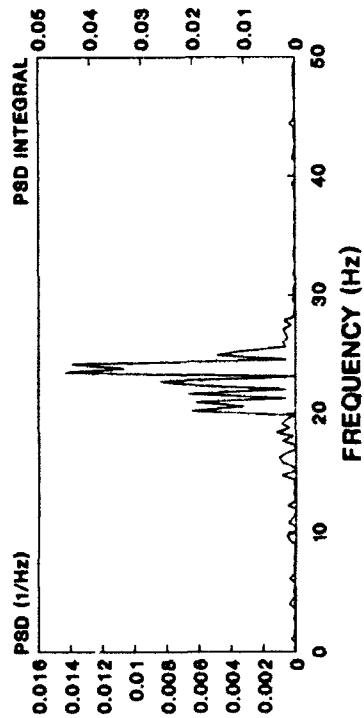


MOMENT COEFF - NORMAL 60 FT/SEC NOMINAL



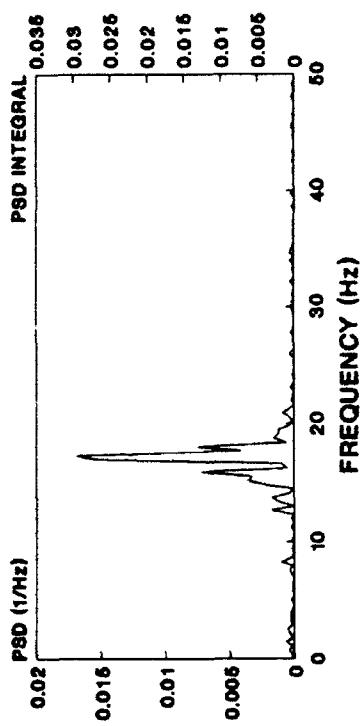
CUBE - HT 0.03 - THETA 00 - AZ - 000

MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



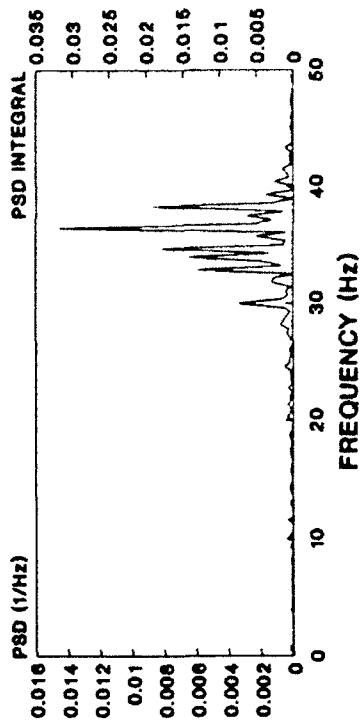
CUBE - HT 0.03 - THETA 00 - AZ - 000

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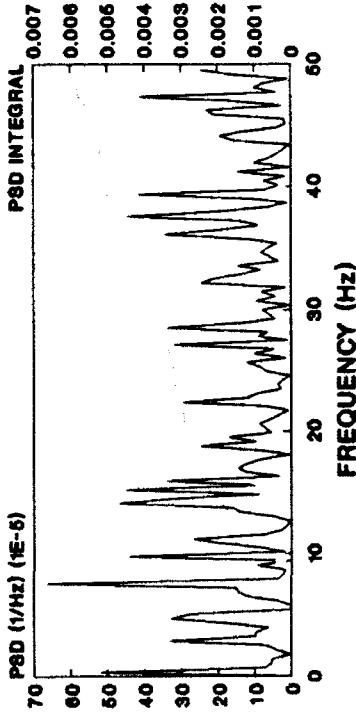
CUBE - HT 0.03 - THETA 00 - AZ - 000

MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL



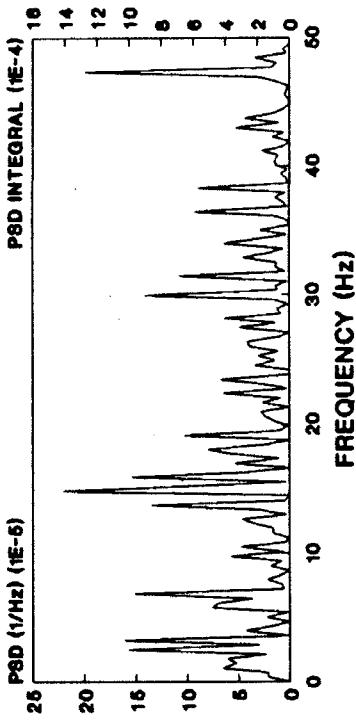
CUBE - HT 0.03 - THETA 00 - AZ - 000

FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



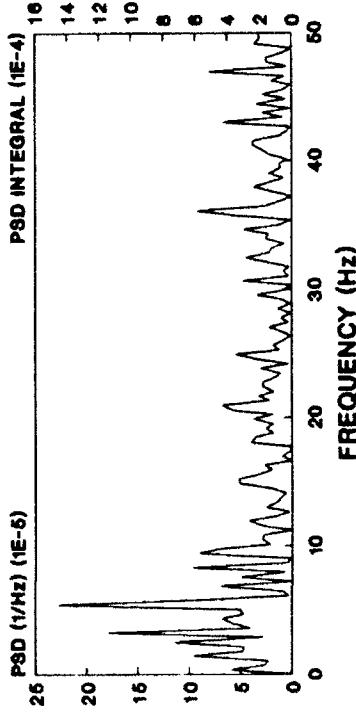
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FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



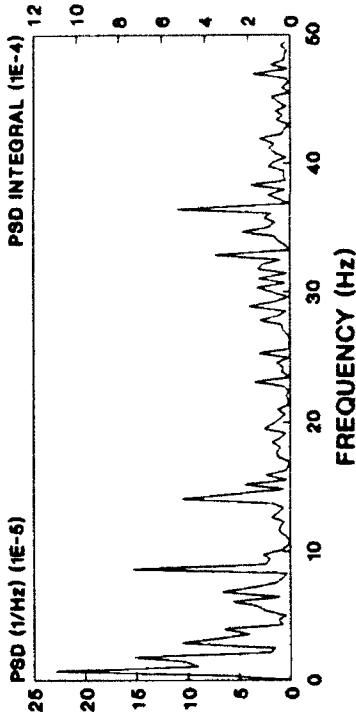
CUBE - HT 6.03 - THETA 00 - AZ 090

FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



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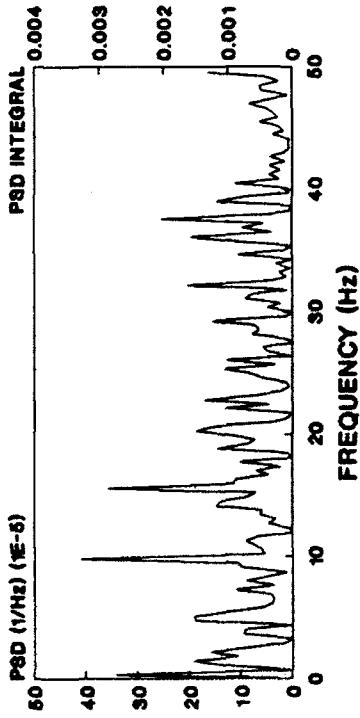
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



CUBE - HT 6.03 - THETA 00 - AZ 090

CUBE - HT 6.03 - THETA 00 - AZ 090

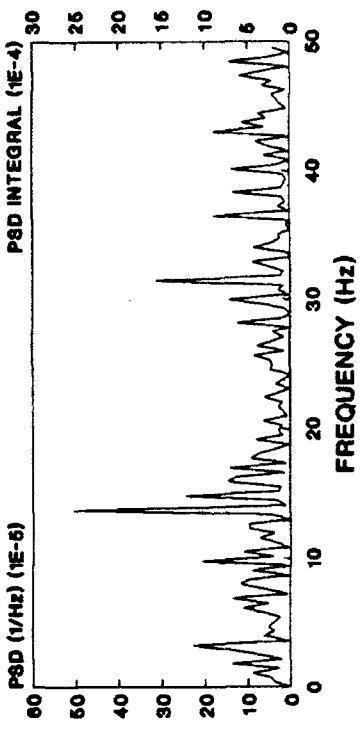
MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



CUBE - HT 0.03 - THETA 00 - AZ 000

— PSD PSD INTEGRAL

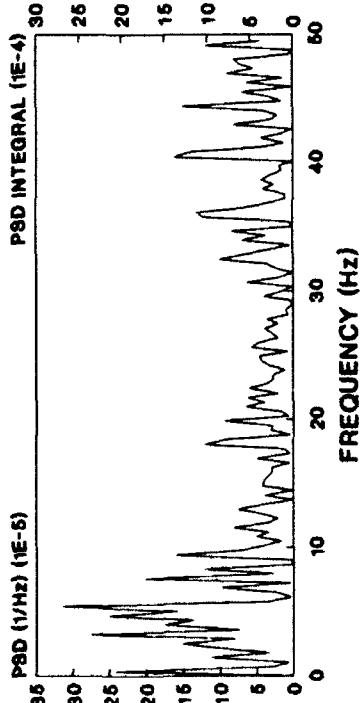
MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



CUBE - HT 0.03 - THETA 00 - AZ 000

— PSD PSD INTEGRAL

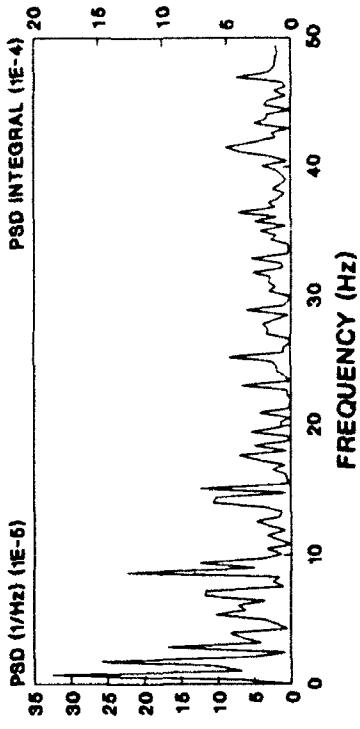
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



CUBE - HT 0.03 - THETA 00 - AZ 000

— PSD PSD INTEGRAL

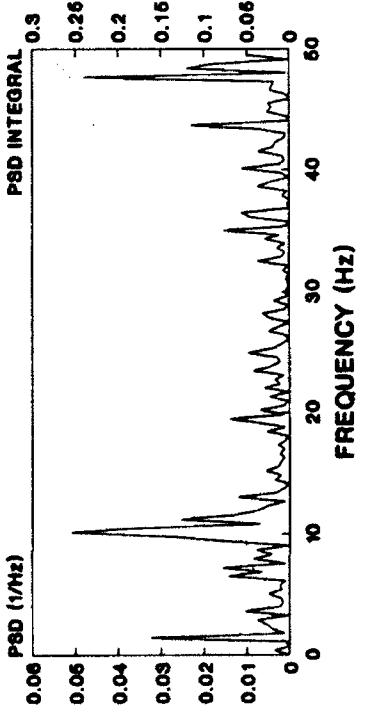
MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



CUBE - HT 0.03 - THETA 00 - AZ 000

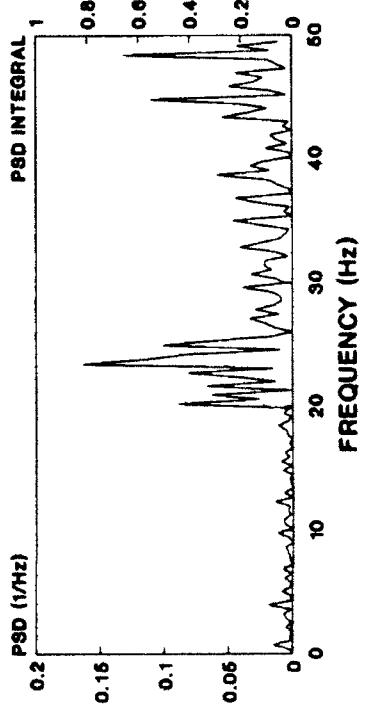
— PSD PSD INTEGRAL

MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



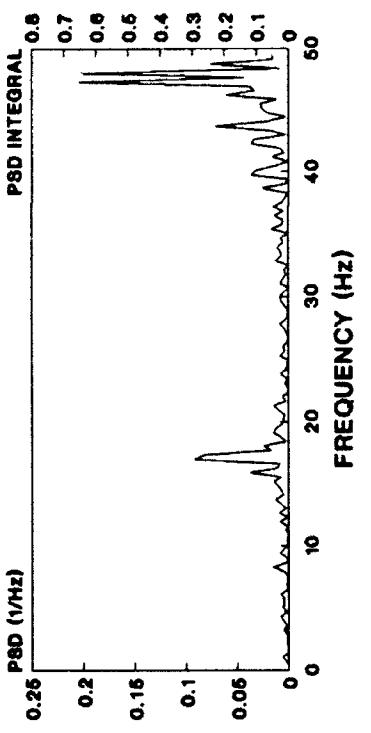
CUBE - HT 0.03 - THETA 00 - AZ - 000

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



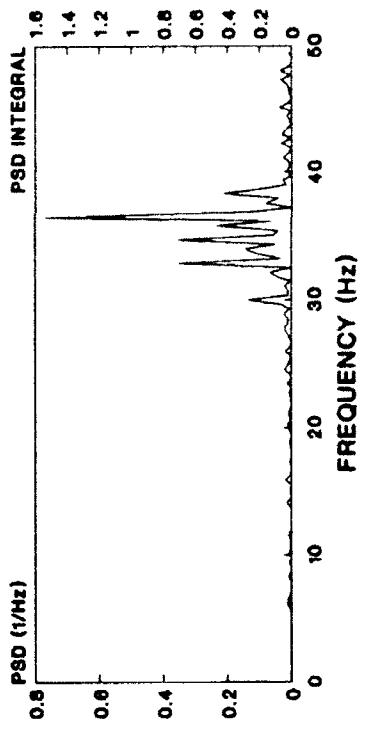
CUBE - HT 0.03 - THETA 00 - AZ - 000

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



CUBE - HT 0.03 - THETA 00 - AZ - 000

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



CUBE - HT 0.03 - THETA 00 - AZ - 000

DATA REPORT

SHAPE:	CUBE
DECLINATION [THETA (degrees)]:	0
DIMENSIONS [LxWxH (in)]:	7.66 x 7.91 x 7.91
WEIGHT (gm):	873.8
TORSION FREQUENCY (Hz):	40
LATERAL (SIDE BEND) FREQUENCY (Hz):	69
NORMAL (AFT BEND) FREQUENCY (Hz):	69
AZIMUTHS (degrees):	0, 30, 45, 60

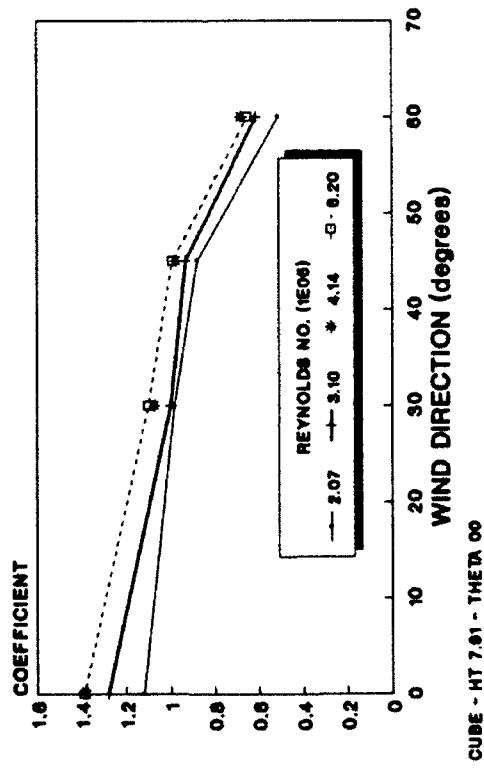
GRAPH CORRECTIONS:

- The mean value of the **ROLL** moment coefficients should be divided by 12.
- The PSD and PSD Integral values of the **ROLL** moment coefficients should be divided by 144.

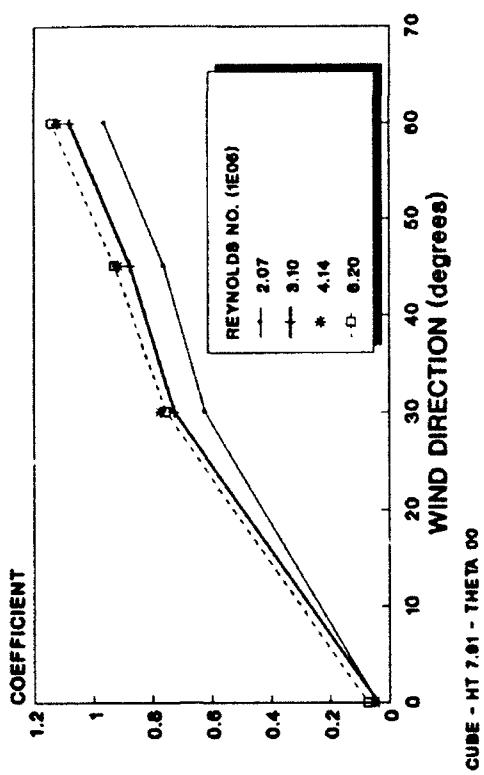
OBSERVATIONS:

- Very good shedding seen in the lateral and roll data at 0 degrees azimuth. One of the best examples of a near single frequency shed.
- 15.176 Hz spike observed in the data.

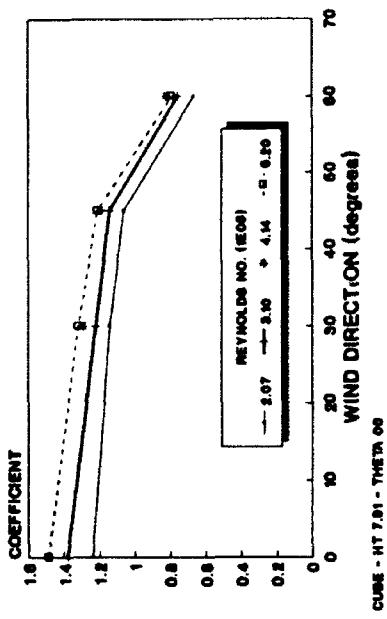
**MEAN FORCE COEFFICIENT
NORMAL DIRECTION**



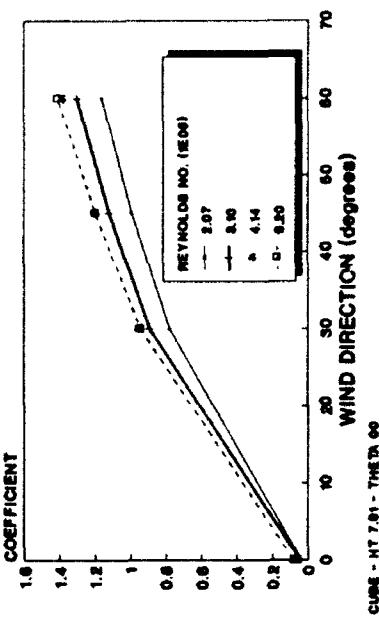
**MEAN FORCE COEFFICIENT
LATERAL DIRECTION**



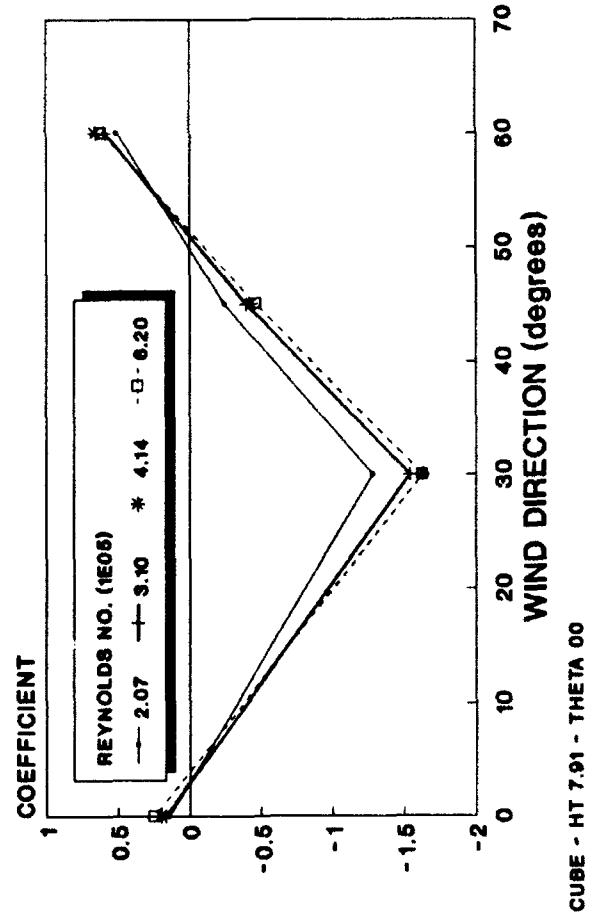
MEAN MOMENT COEFFICIENT NORMAL DIRECTION



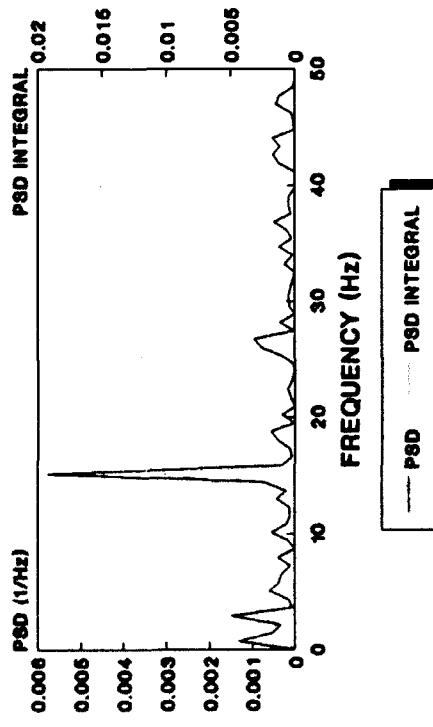
MEAN MOMENT COEFFICIENT LATERAL DIRECTION



MEAN MOMENT COEFFICIENT ROLL DIRECTION

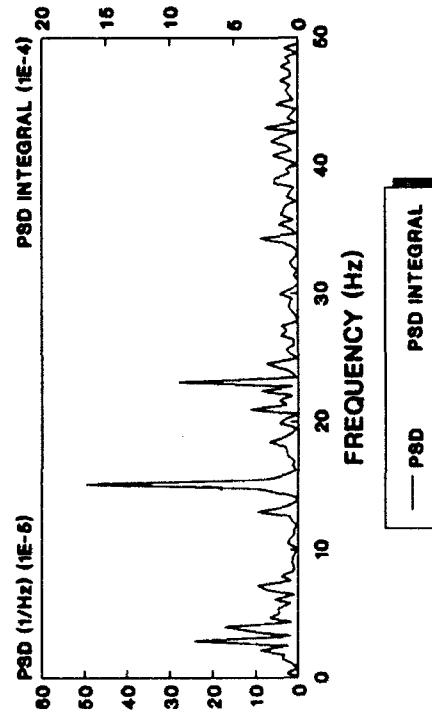


FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



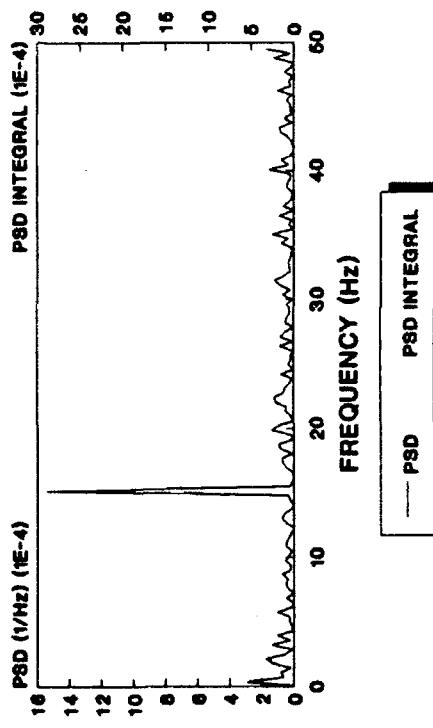
CUBE - HT 7.01 - THETA 00 - AZ 000

FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



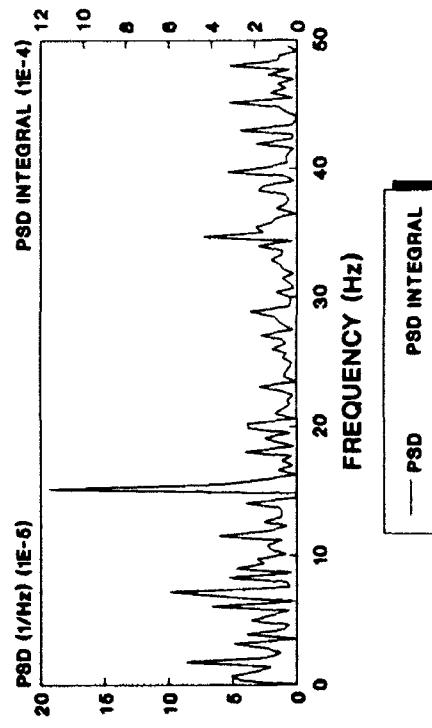
CUBE - HT 7.01 - THETA 00 - AZ 000

FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



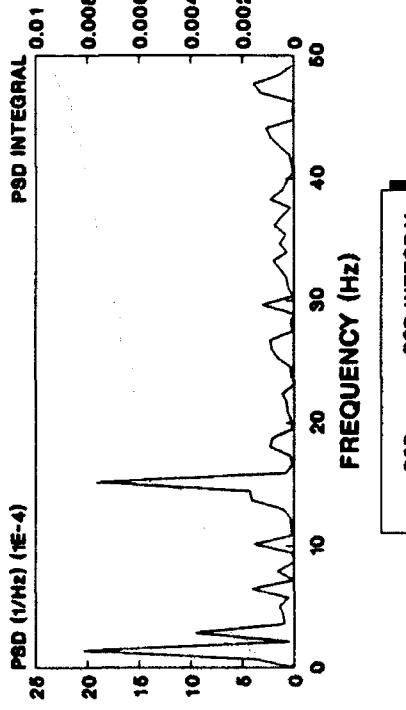
CUBE - HT 7.01 - THETA 00 - AZ 000

FORCE COEFF - NORMAL 180 FT/SEC NOMINAL

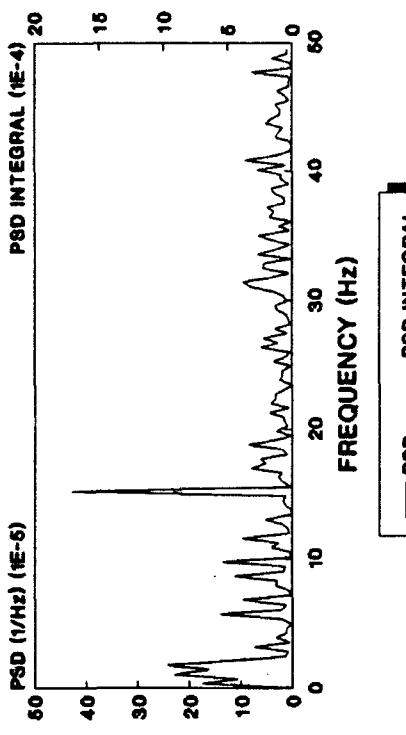


CUBE - HT 7.01 - THETA 00 - AZ 000

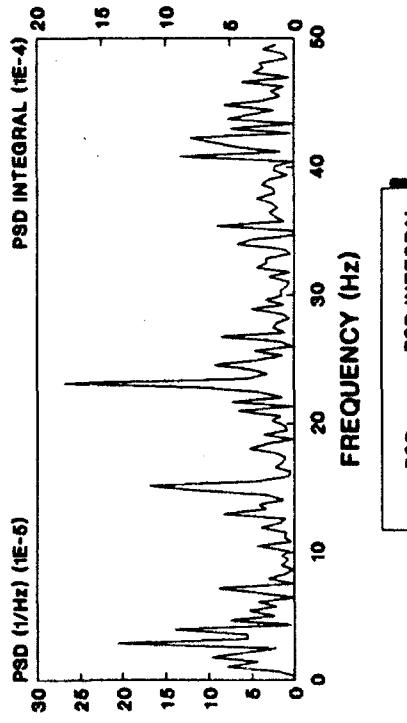
MOMENT COEFF - NORMAL 60 FT/SEC NOMINAL



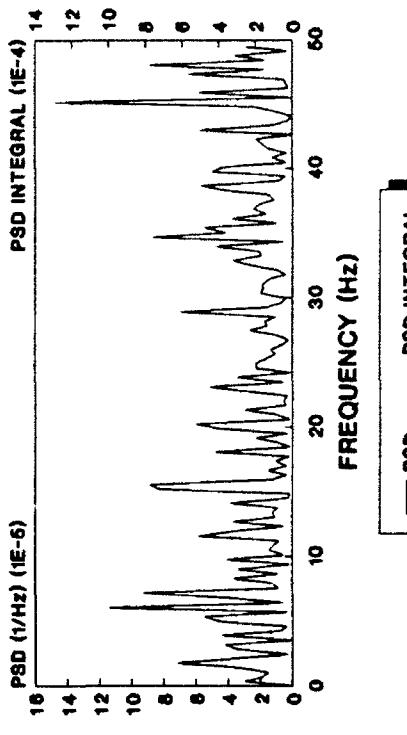
MOMENT COEFF - NORMAL 90 FT/SEC NOMINAL



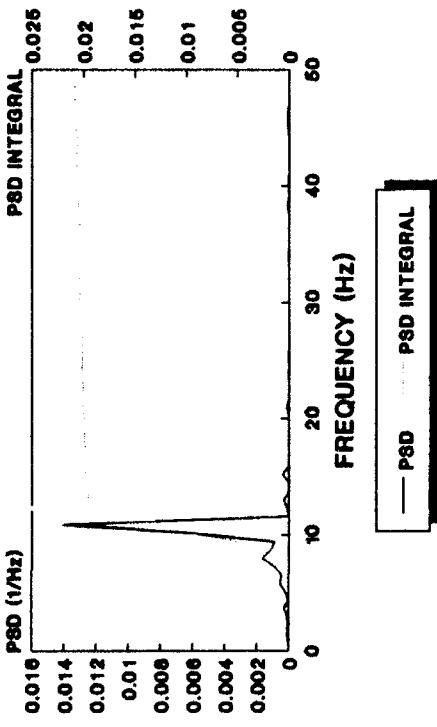
MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



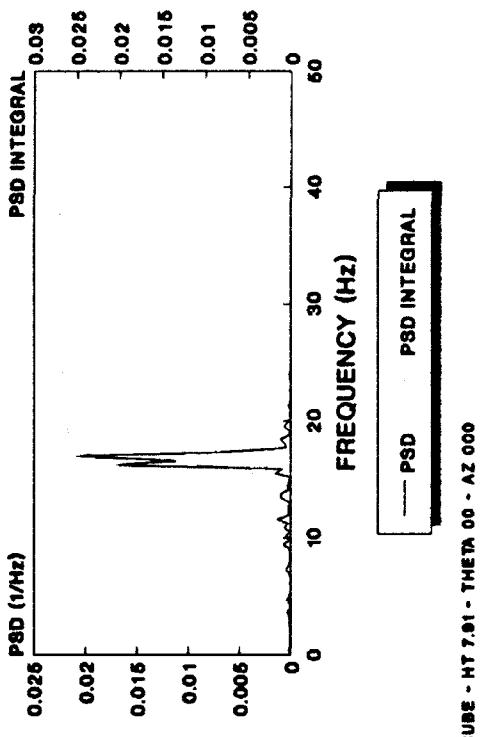
MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL



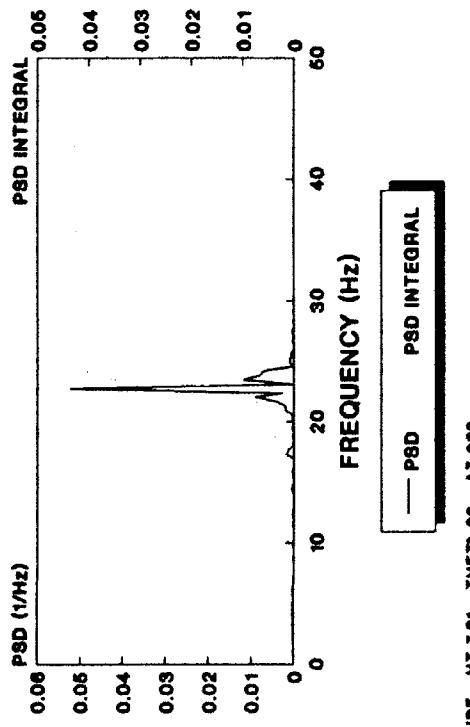
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



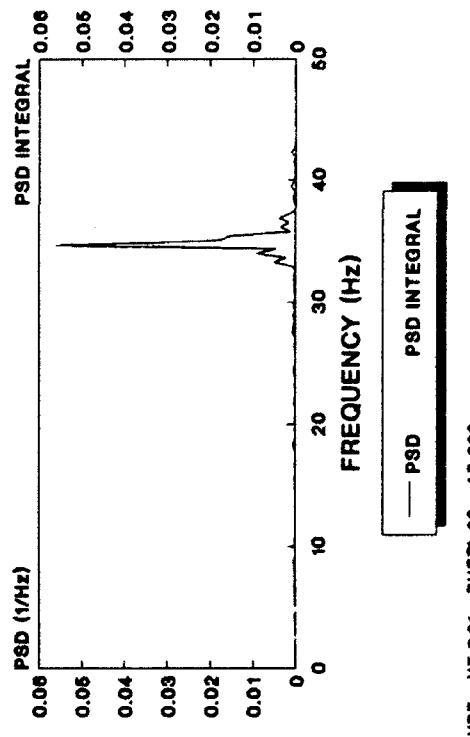
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



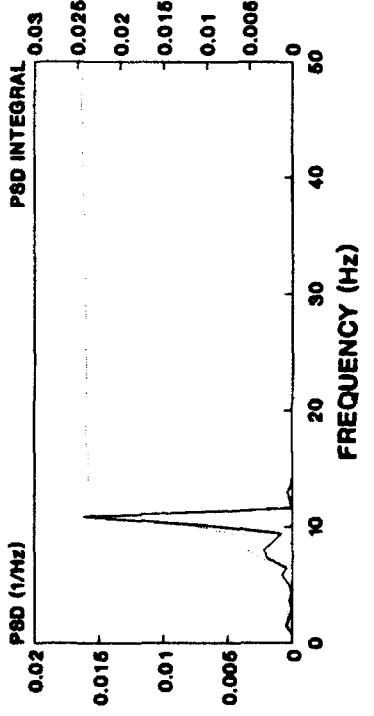
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



FORCE COEFF - LATERAL 180 FT/SEC NOMINAL

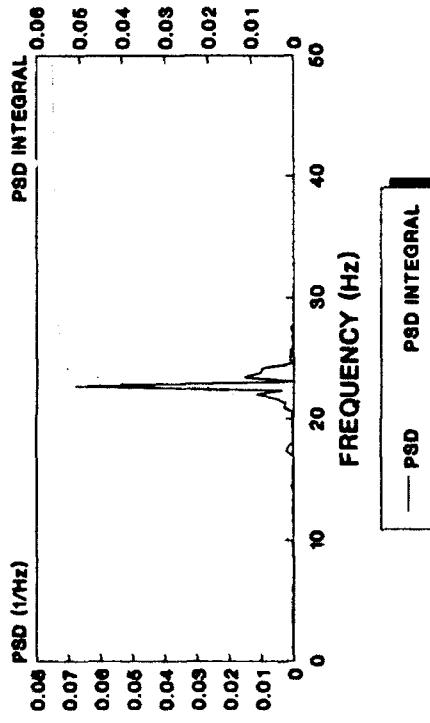


MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



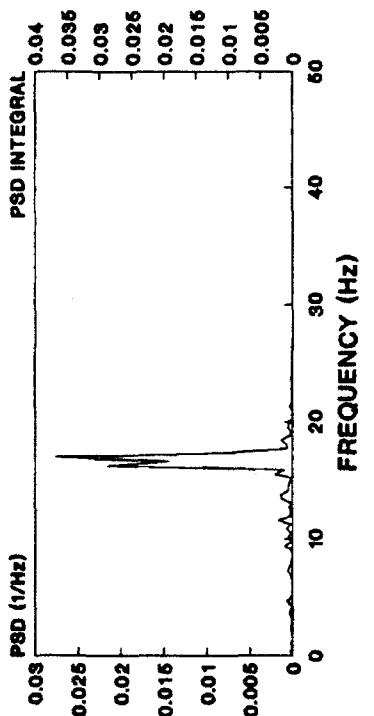
CUBE - HT 7.91 - THETA 00 - AZ 000

MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



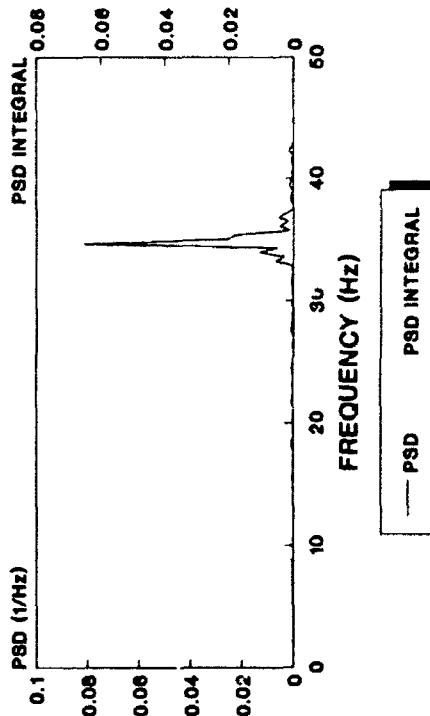
CUBE - HT 7.91 - THETA 00 - AZ 000

MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



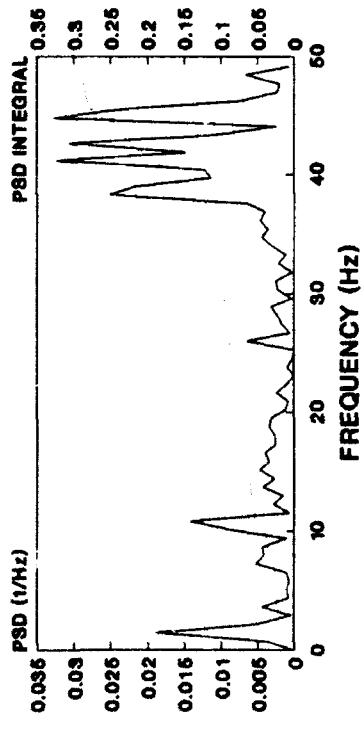
CUBE - HT 7.91 - THETA 00 - AZ 000

MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



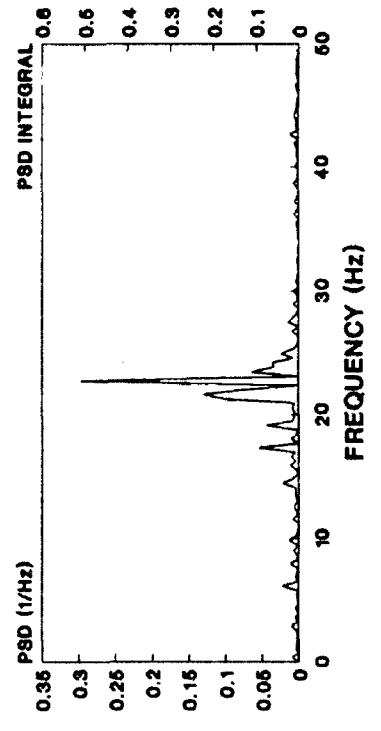
CUBE - HT 7.91 - THETA 00 - AZ 000

MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



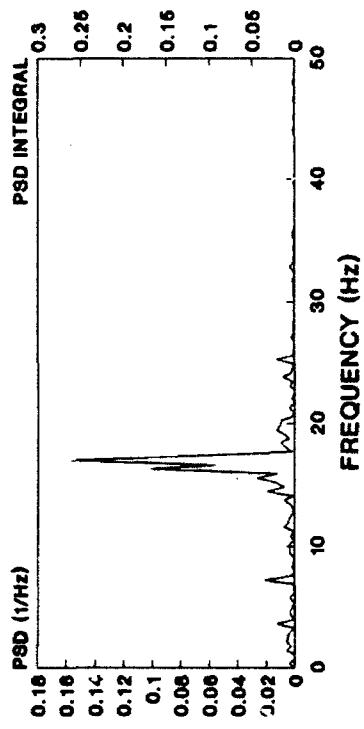
CUBE - HT 7.91 - THETA 00 - AZ 000

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



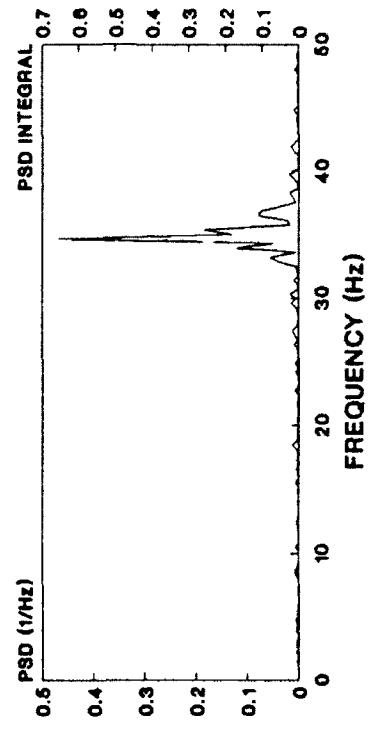
CUBE - HT 7.91 - THETA 00 - AZ 000

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



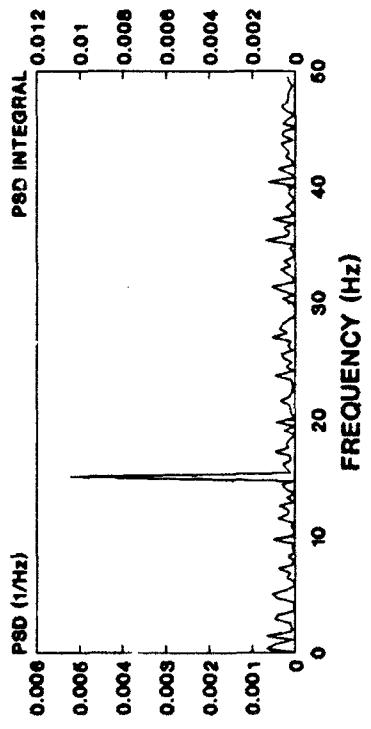
CUBE - HT 7.91 - THETA 00 - AZ 000

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



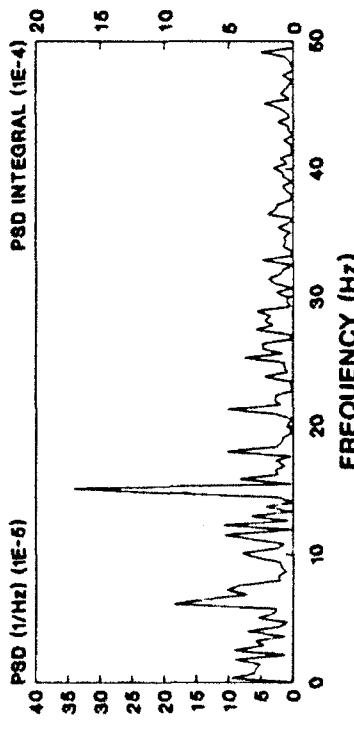
CUBE - HT 7.91 - THETA 00 - AZ 000

FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



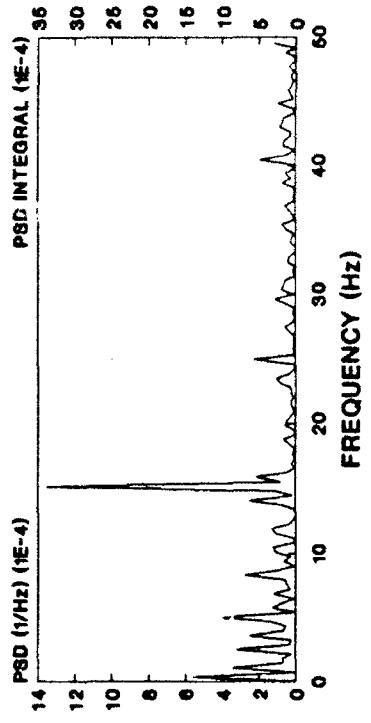
CUBE - HT 7.91 - THETA 00 - AZ 030

FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



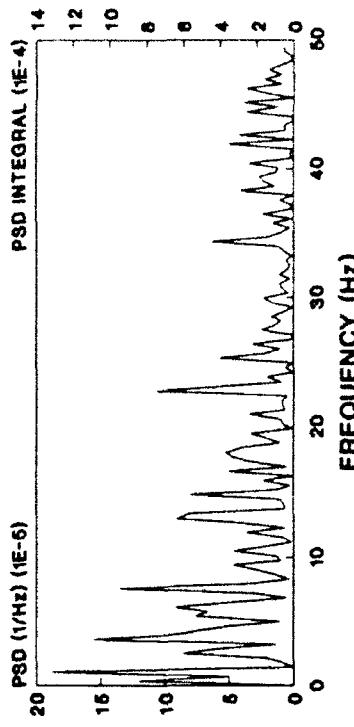
CUBE - HT 7.91 - THETA 00 - AZ 030

FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



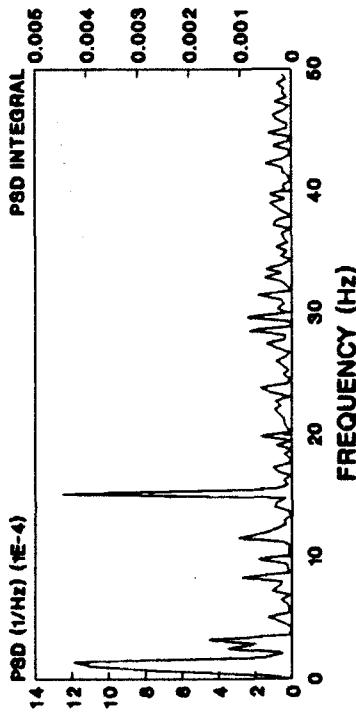
CUBE - HT 7.91 - THETA 00 - AZ 030

FORCE COEFF - NORMAL 180 FT/SEC NOMINAL

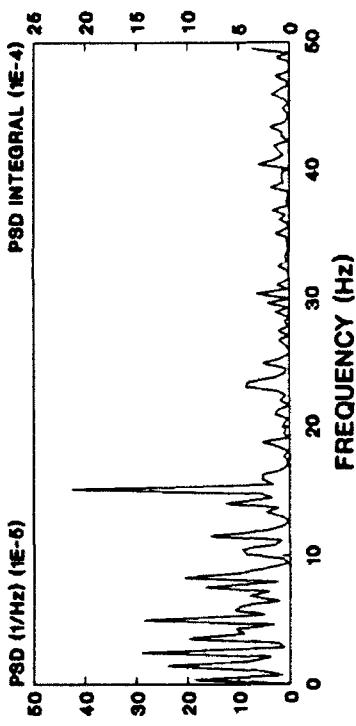


CUBE - HT 7.91 - THETA 00 - AZ 030

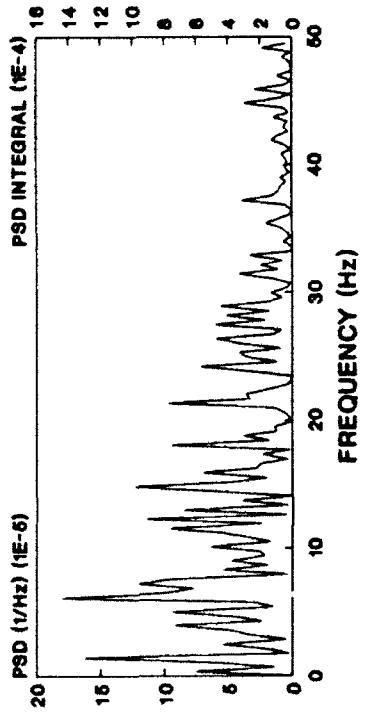
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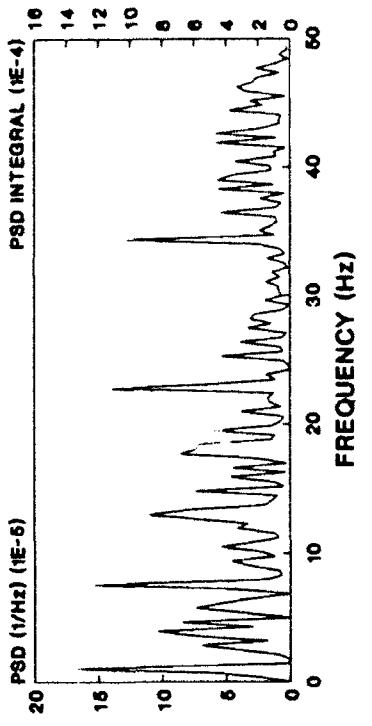
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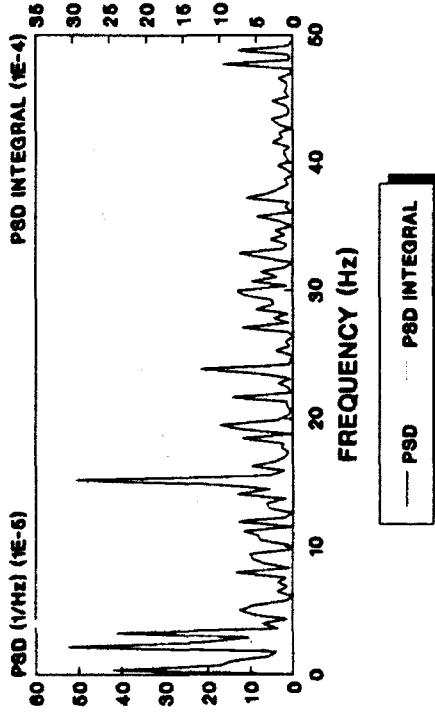
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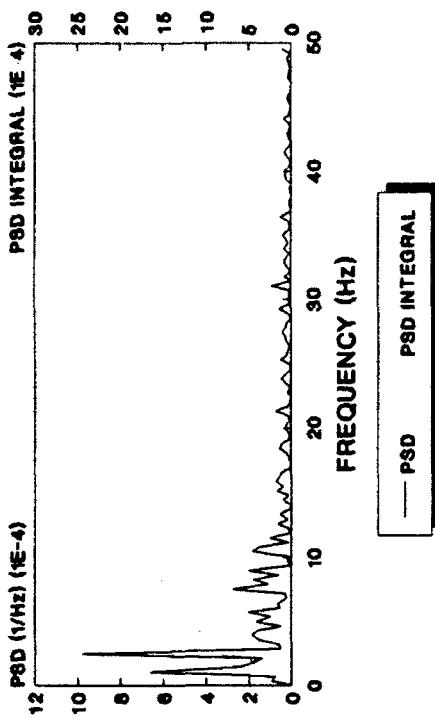
MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL



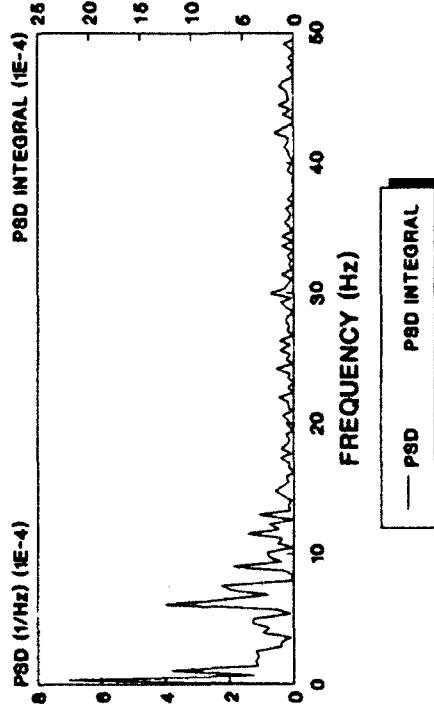
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



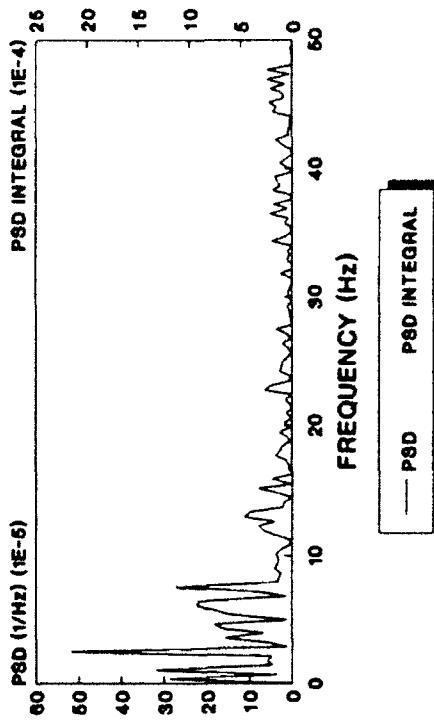
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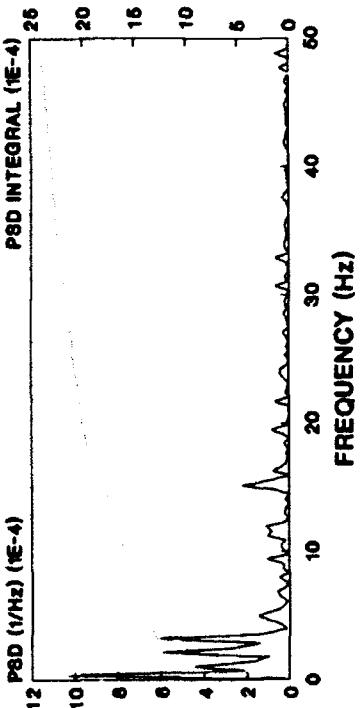
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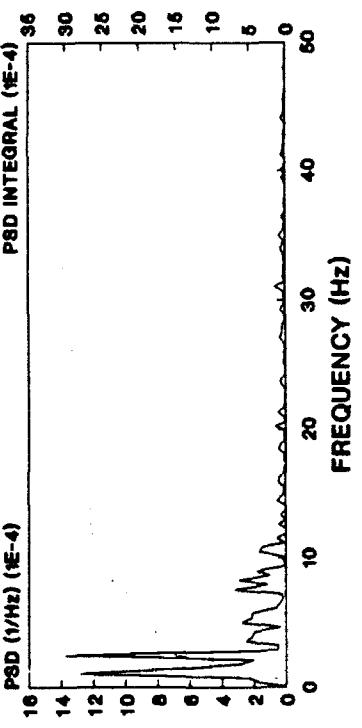
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



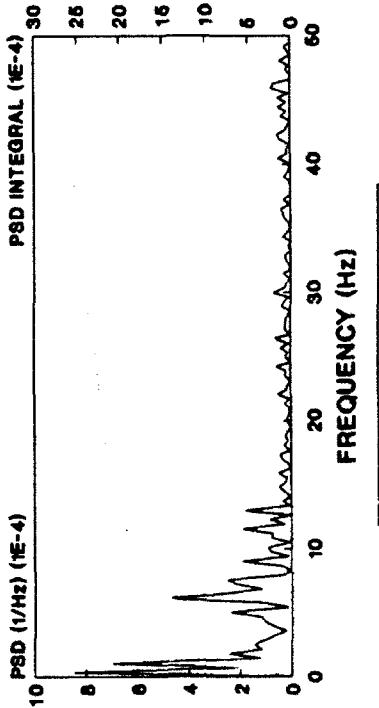
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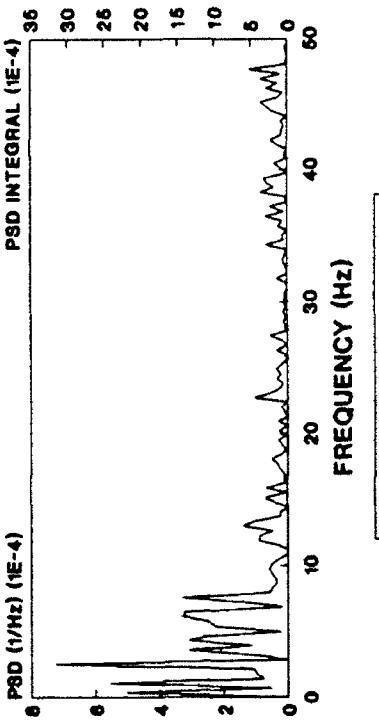
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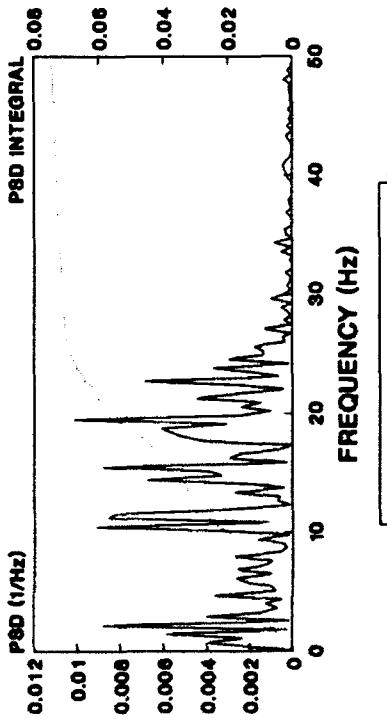
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL

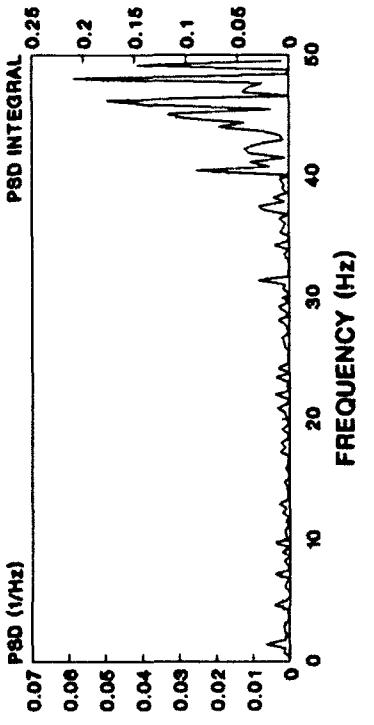


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



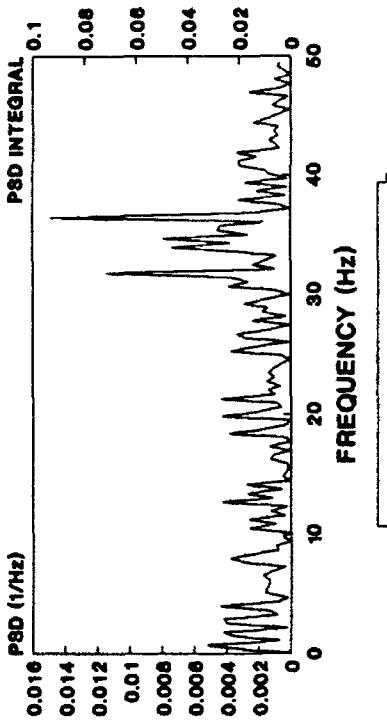
CUBE - HT 7.01 - THETA 00 - AZ 030

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



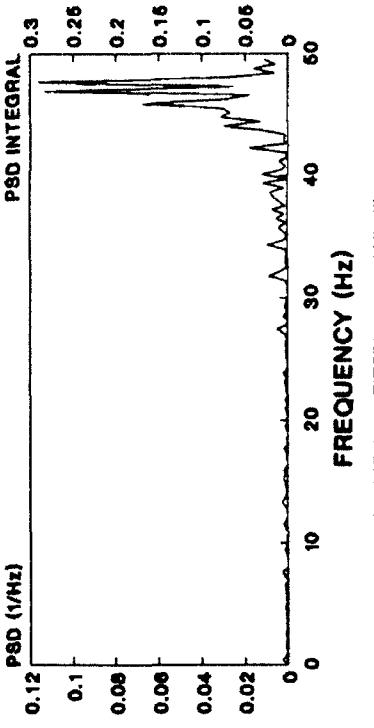
CUBE - HT 7.01 - THETA 00 - AZ 030

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



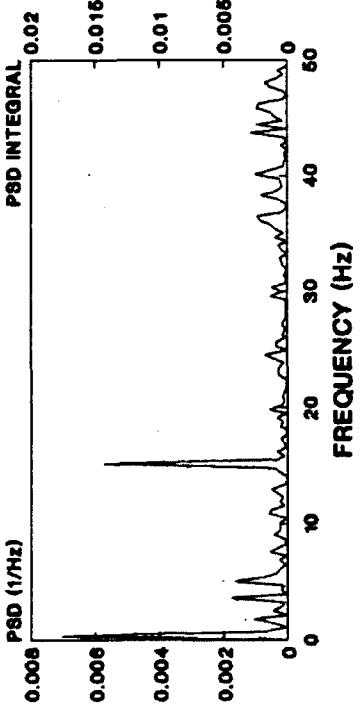
CUBE - HT 7.01 - THETA 00 - AZ 030

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

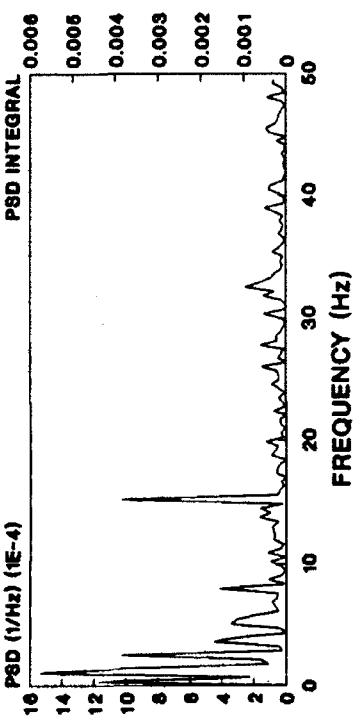


CUBE - HT 7.01 - THETA 00 - AZ 030

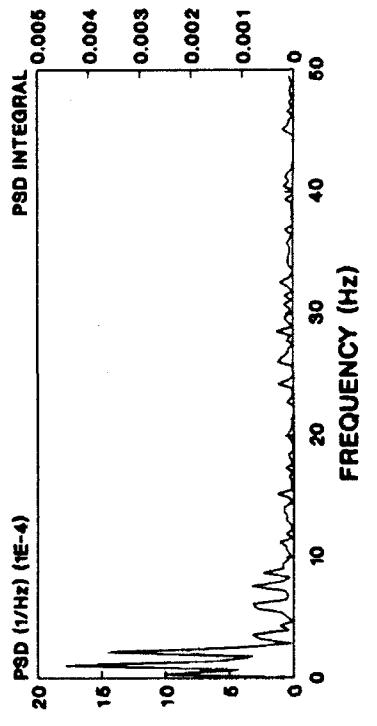
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



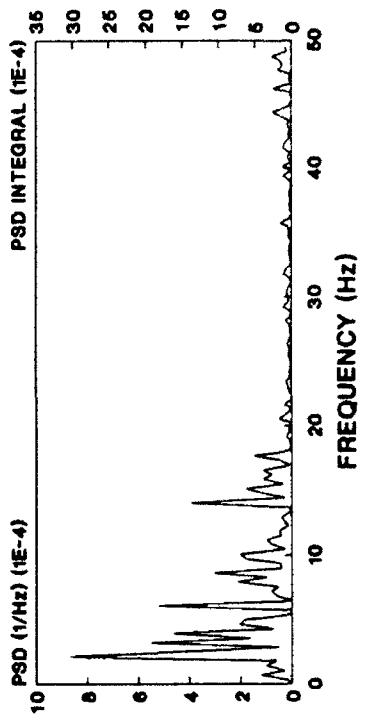
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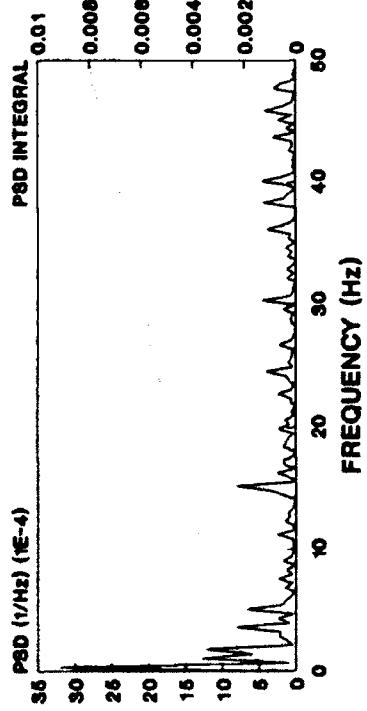
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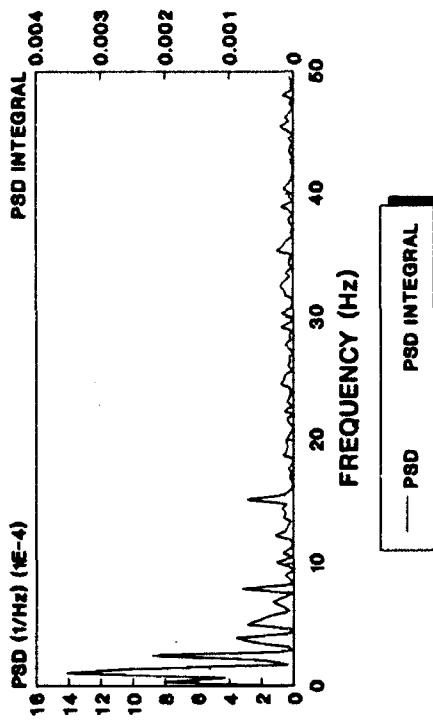
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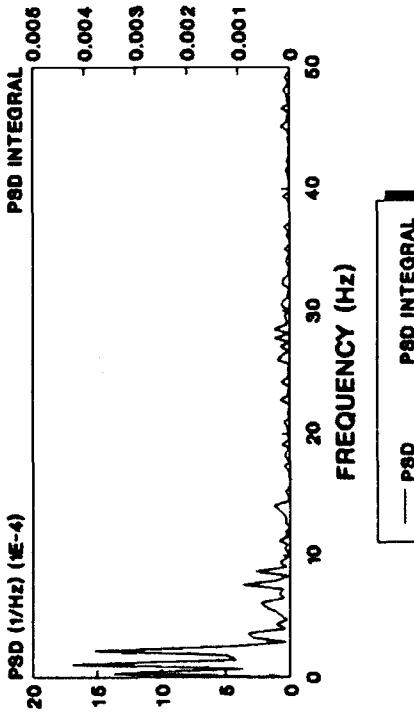
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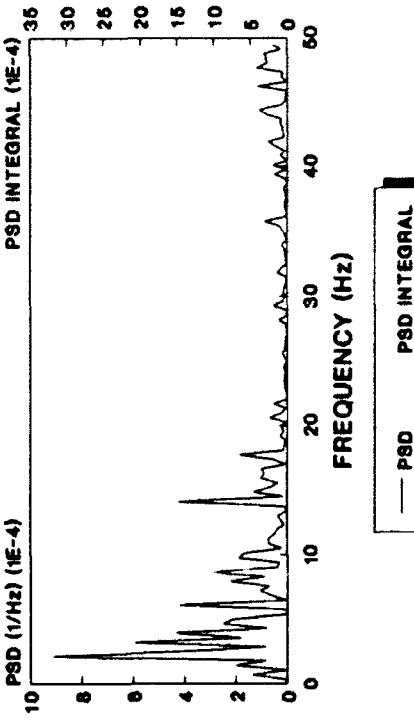
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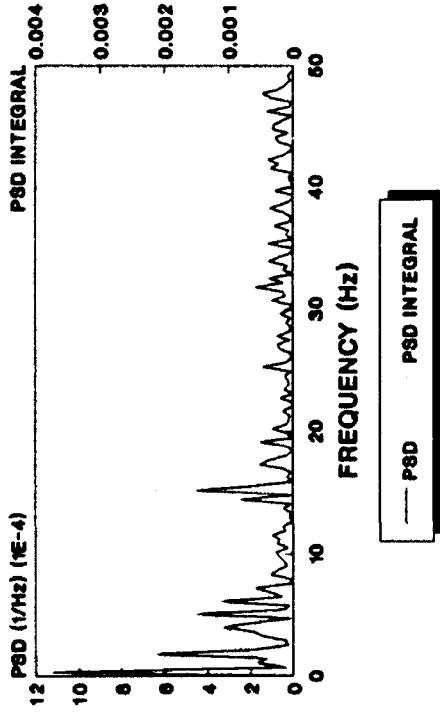
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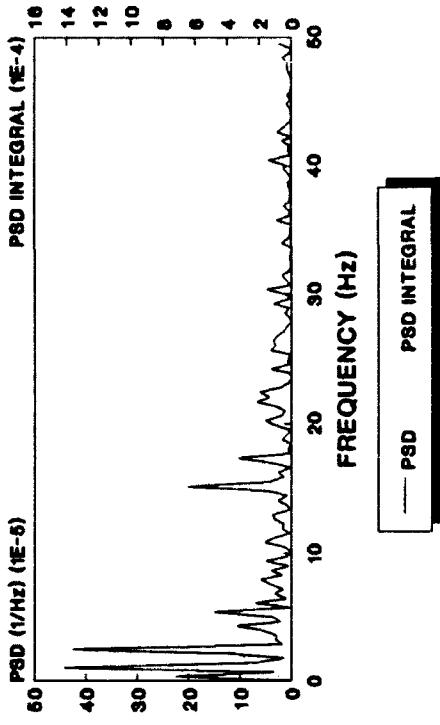
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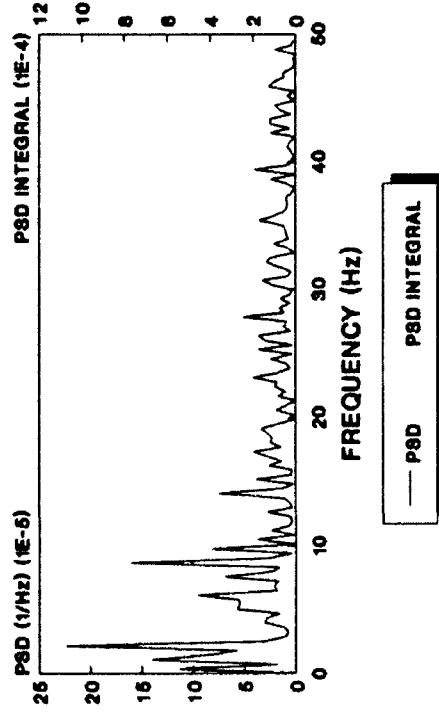
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



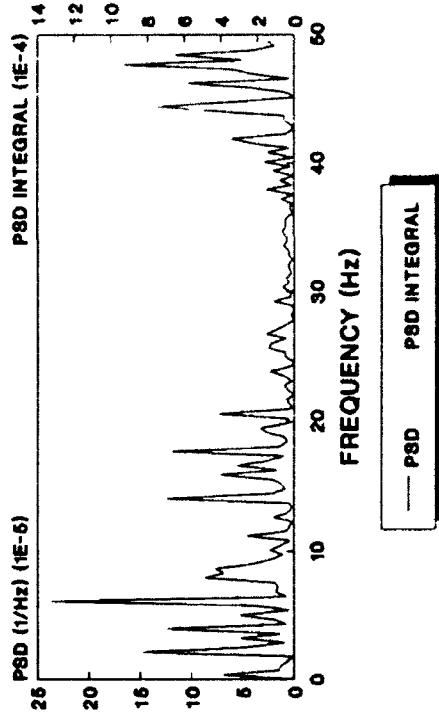
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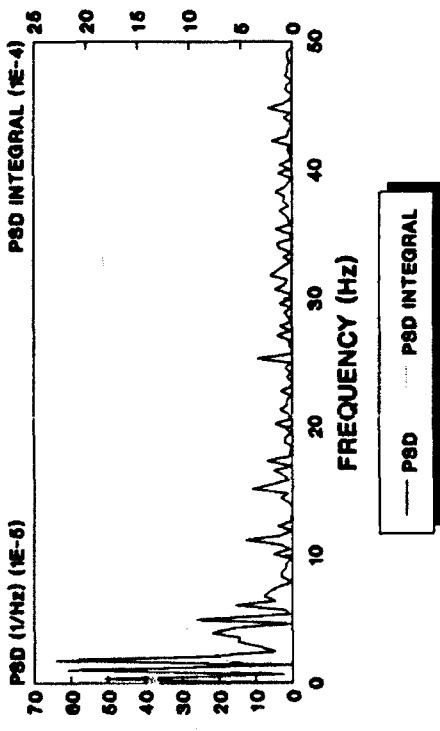
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



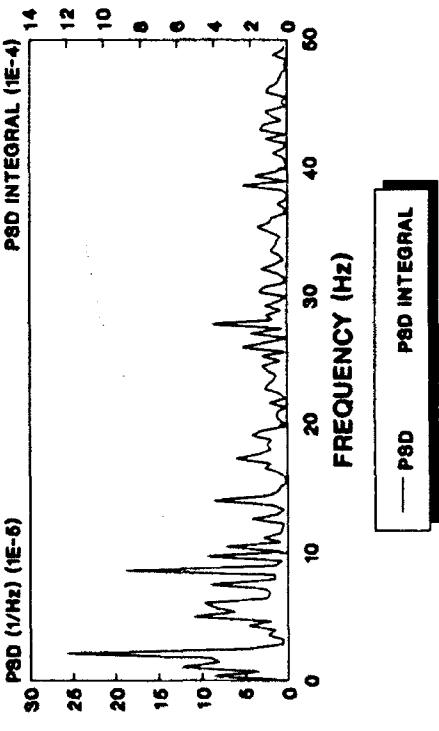
MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



CUBE - HT 7.01 - THETA 00 - AZ 048

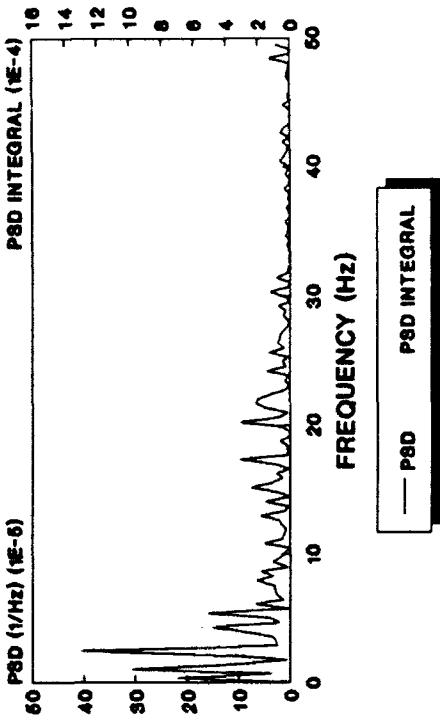
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MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



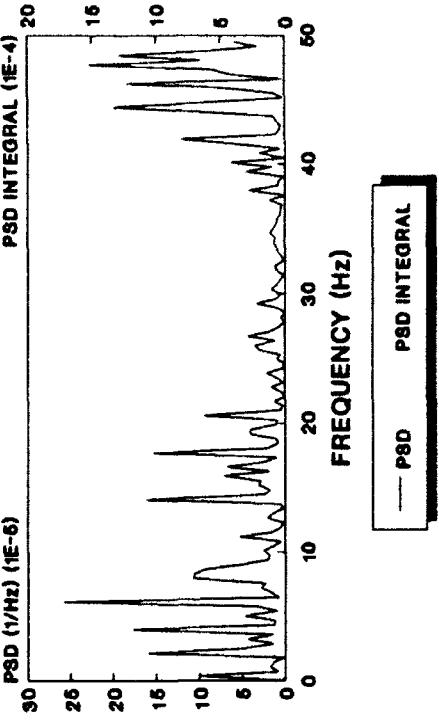
CUBE - HT 7.01 - THETA 00 - AZ 048

MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



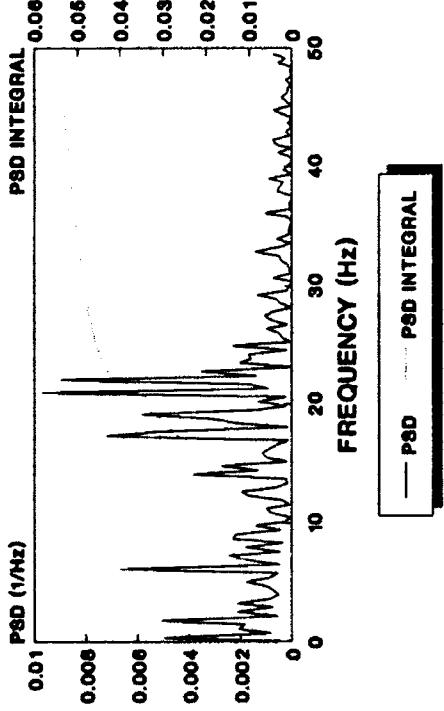
CUBE - HT 7.01 - THETA 00 - AZ 048

MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



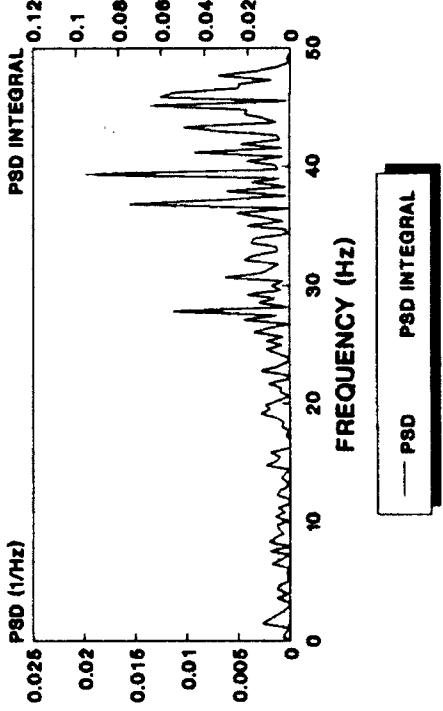
CUBE - HT 7.01 - THETA 00 - AZ 048

MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



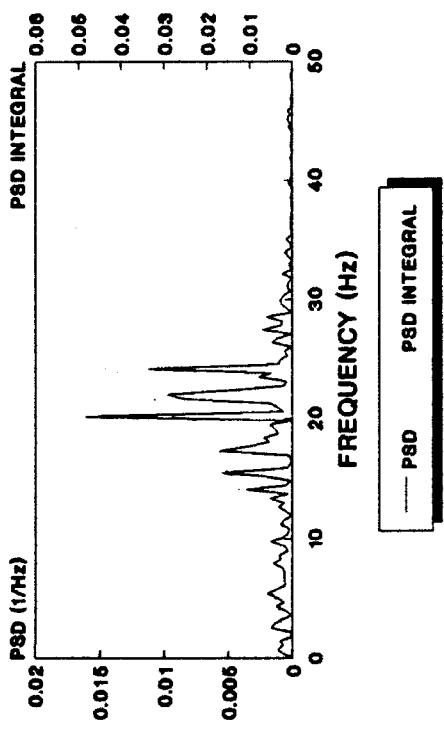
CUBE - HT 7.01 - THETA 00 - AZ 045

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



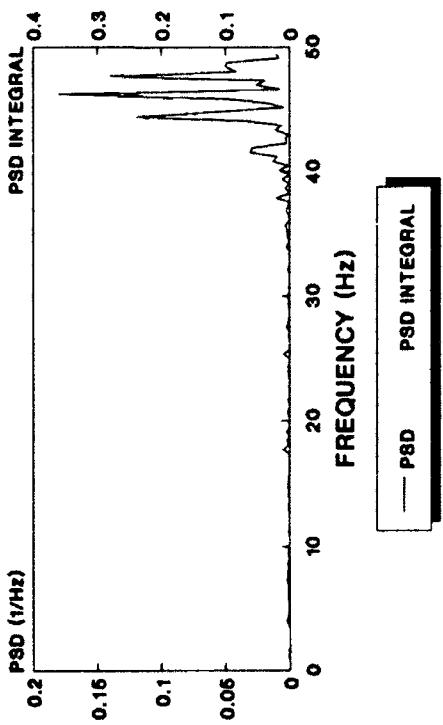
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MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



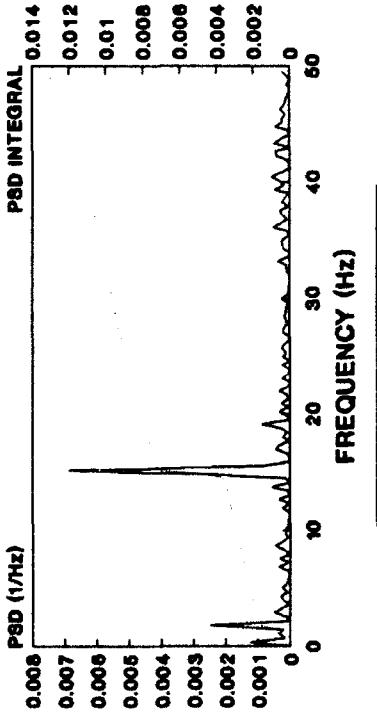
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MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



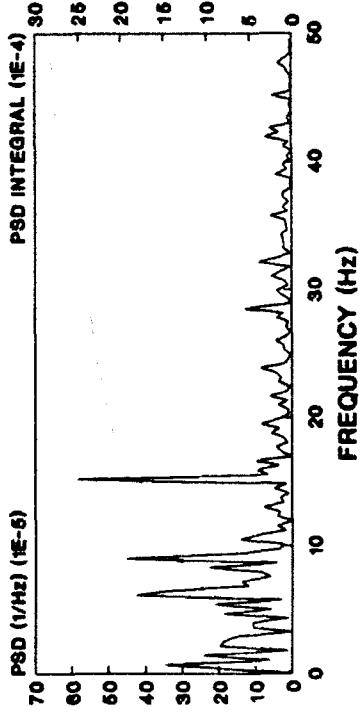
CUBE - HT 7.01 - THETA 00 - AZ 045

FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



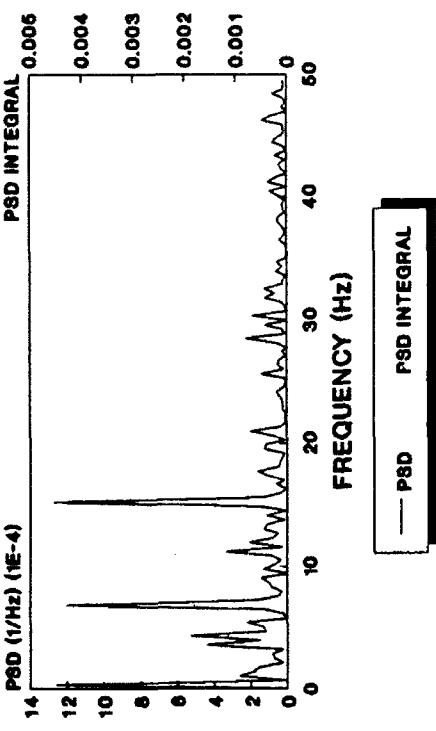
CUBE - HT 7.01 - THETA 00 - AZ 000

FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



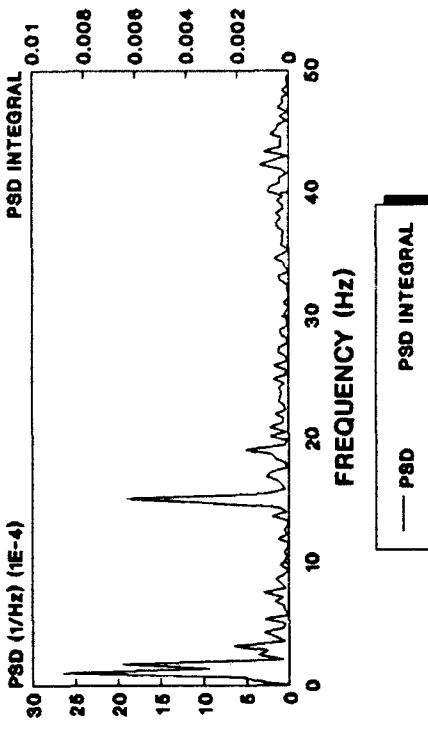
CUBE - HT 7.01 - THETA 00 - AZ 000

FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



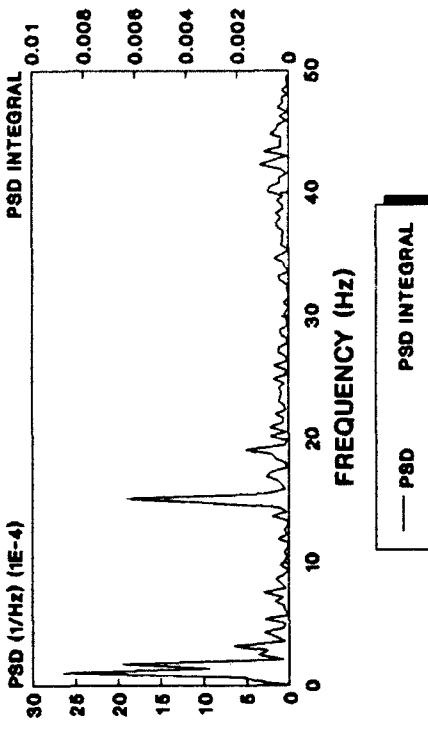
CUBE - HT 7.01 - THETA 00 - AZ 000

MOMENT COEFF - NORMAL 60 FT/SEC NOMINAL



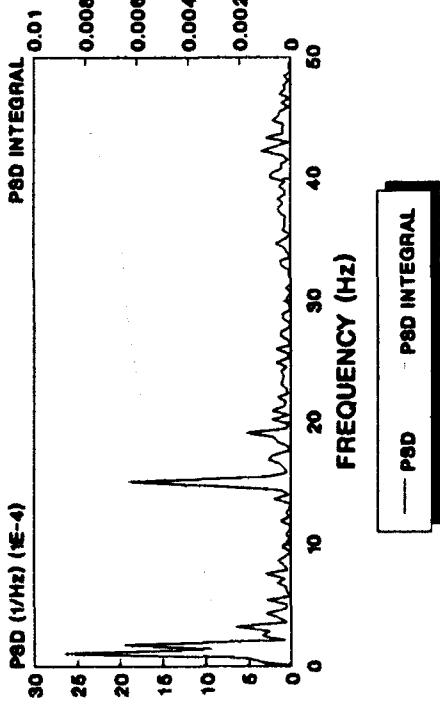
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MOMENT COEFF - NORMAL 90 FT/SEC NOMINAL

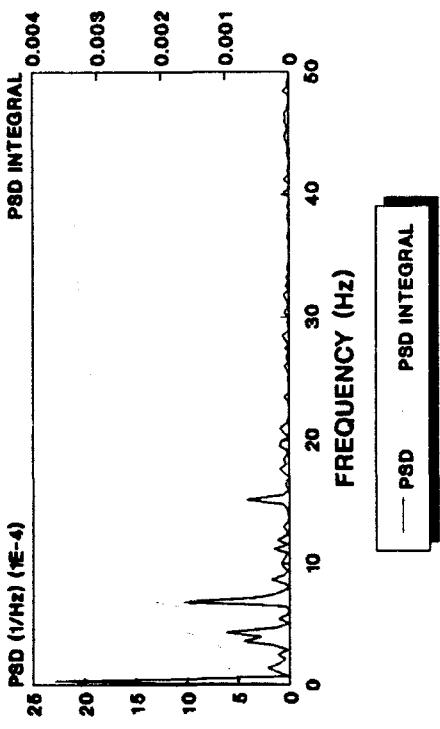


CUBE - HT 7.01 - THETA 00 - AZ 000

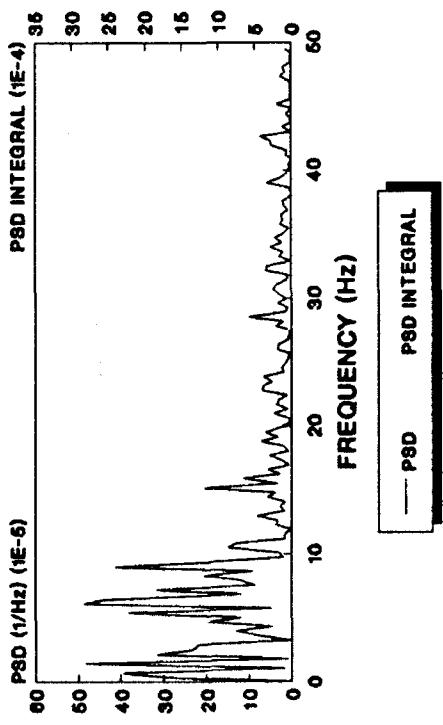
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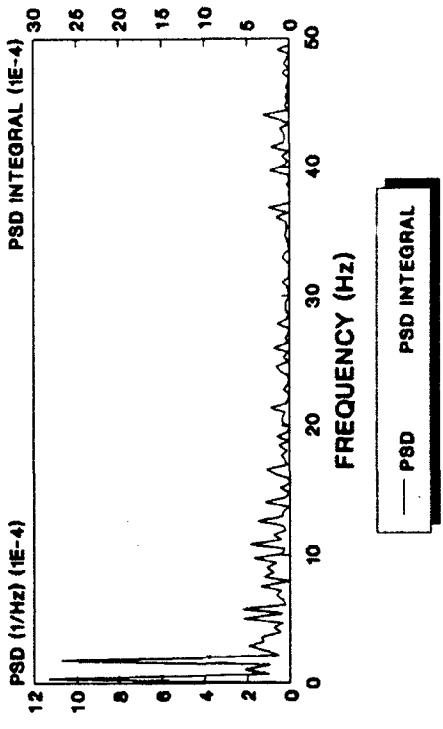
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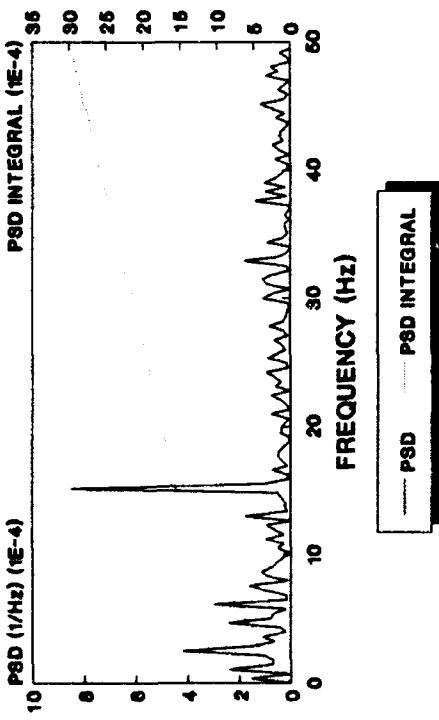
MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



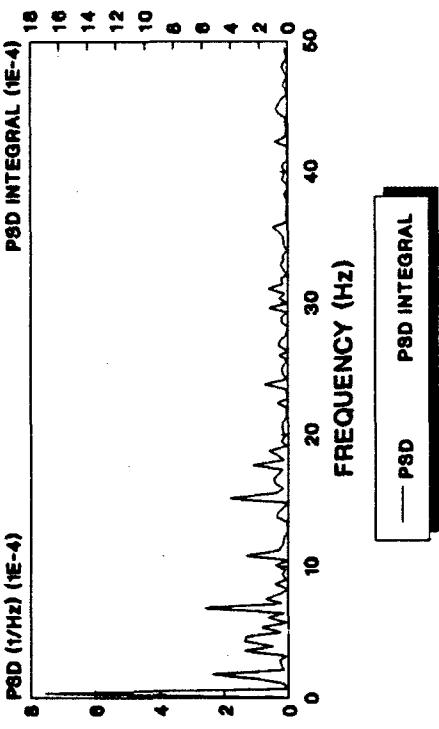
MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL



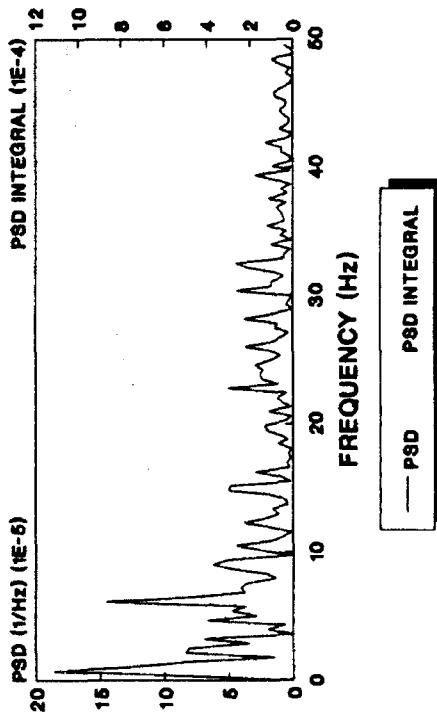
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



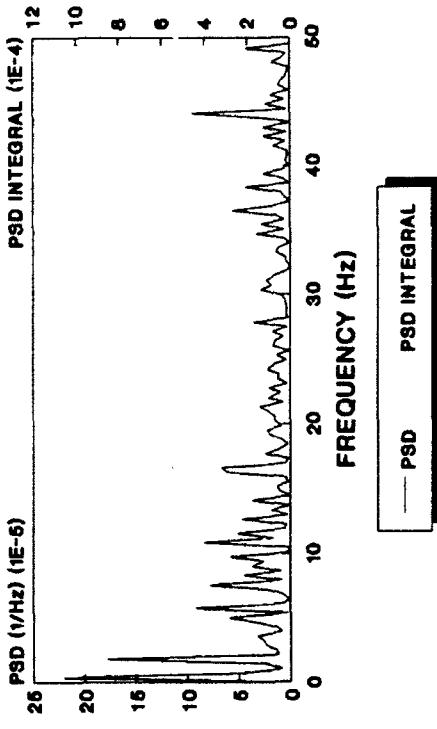
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



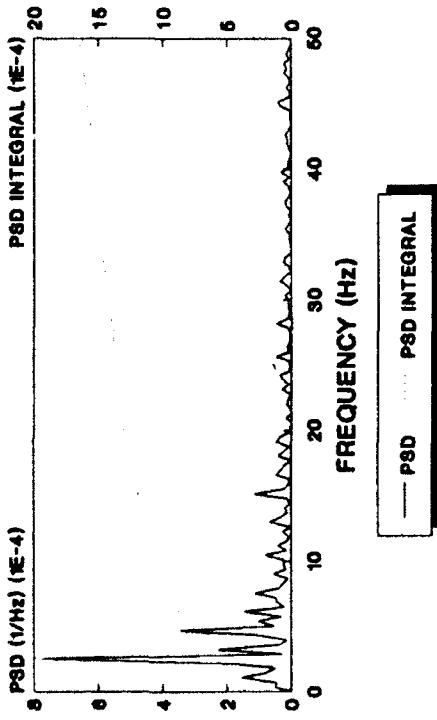
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



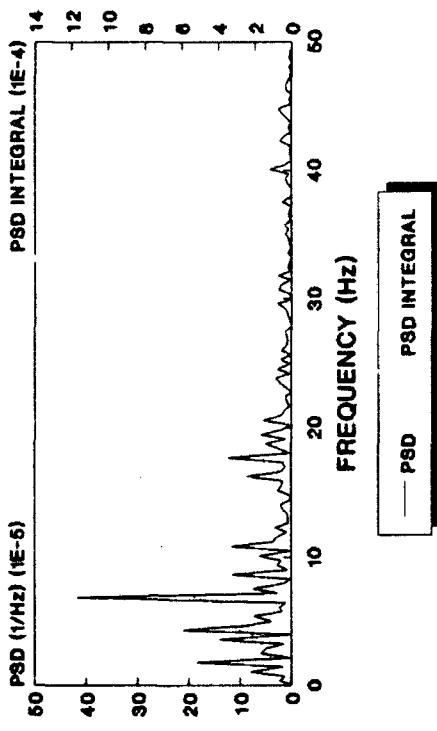
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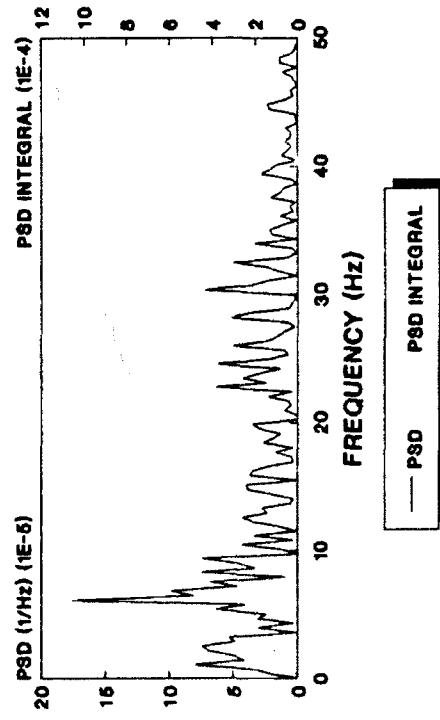
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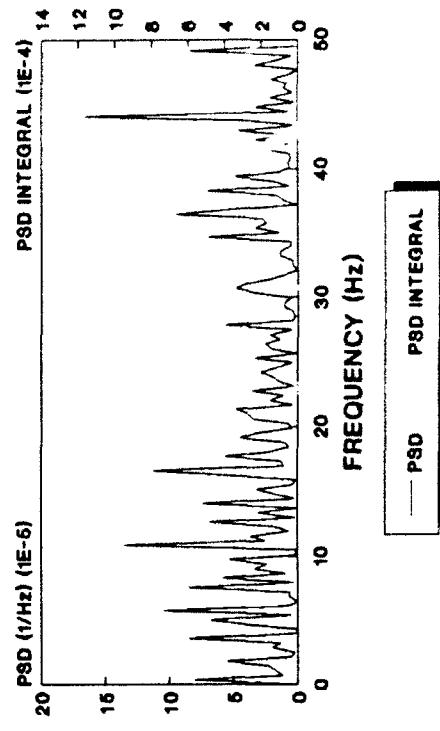
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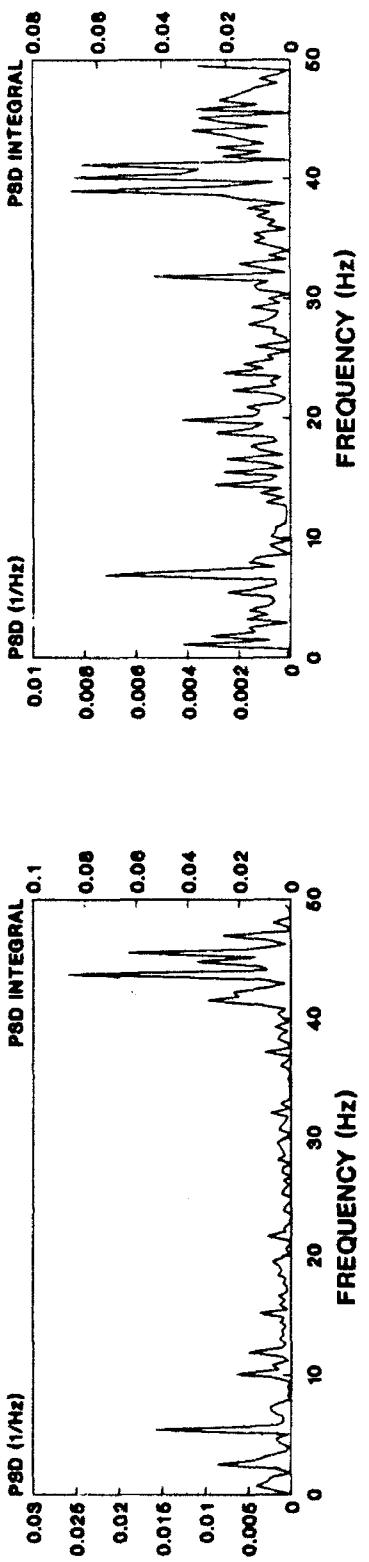
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



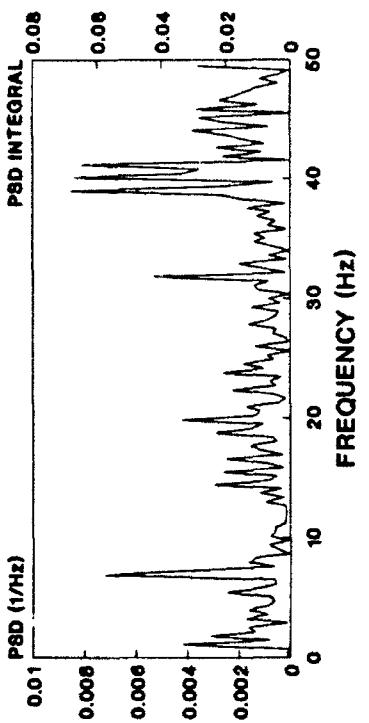
MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



CUBE - HT 7.91 - THETA 00 - AZ 080

— PSD ... PSD INTEGRAL

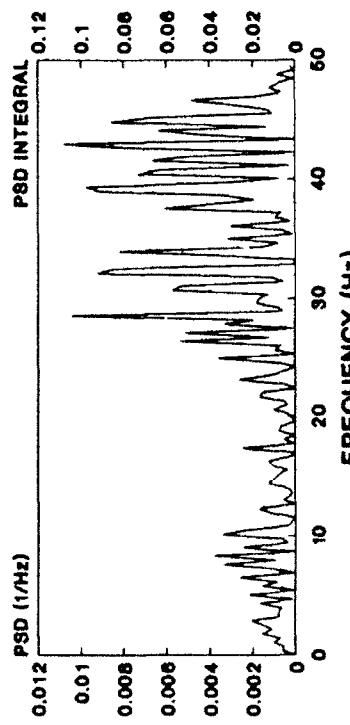
MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



CUBE - HT 7.91 - THETA 00 - AZ 080

— PSD ... PSD INTEGRAL

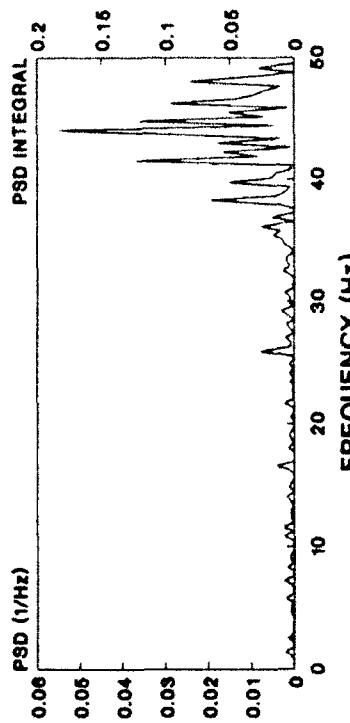
MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



CUBE - HT 7.91 - THETA 00 - AZ 080

— PSD ... PSD INTEGRAL

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



CUBE - HT 7.91 - THETA 00 - AZ 080

— PSD ... PSD INTEGRAL

DATA REPORT

SHAPE:	CUBE
DECLINATION [THETA (degrees)]:	0
DIMENSIONS [LxWxH (in)]:	7.62 x 7.88 x 9.56
WEIGHT (gm):	1009.5
TORSION FREQUENCY (Hz):	30
LATERAL (SIDE BEND) FREQUENCY (Hz):	43
NORMAL (AFT BEND) FREQUENCY (Hz):	46
AZIMUTHS (degrees):	0, 30, 45

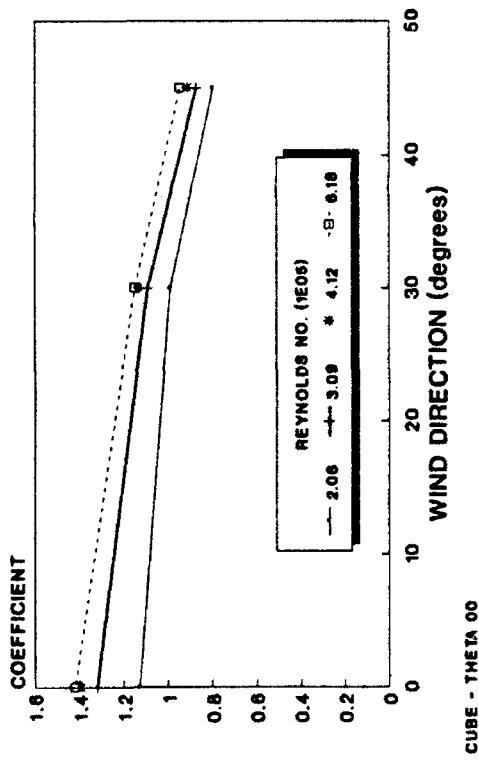
GRAPH CORRECTIONS:

- The mean value of the **ROLL** moment coefficients should be divided by 12.
- The PSD and PSD Integral values of the **ROLL** moment coefficients should be divided by 144.

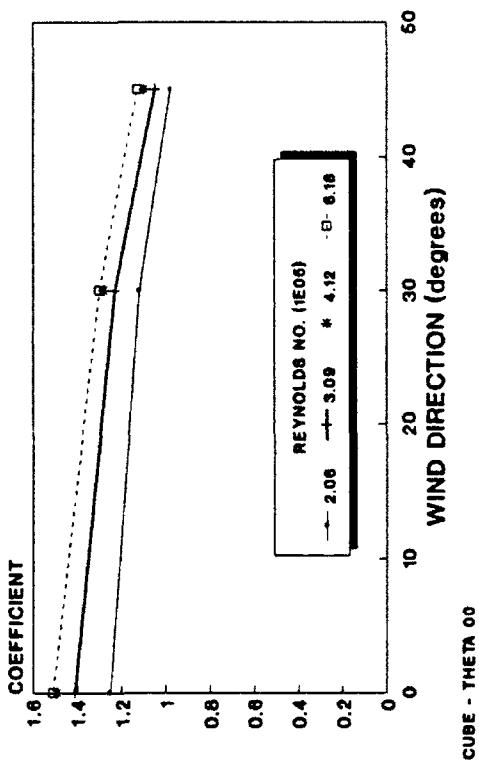
OBSERVATIONS:

- Very good shedding is seen in the lateral data at 0 degrees azimuth. This shedding is nearly single frequency in nature.
- 15.176 Hz spike occasionally observed in the data.

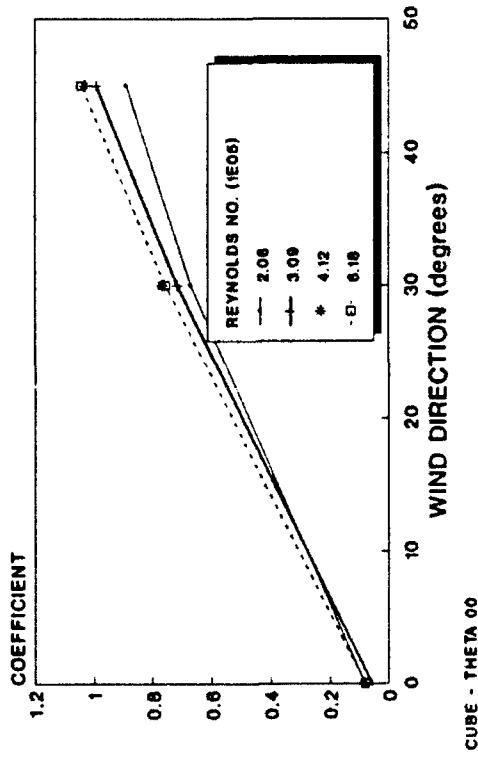
MEAN FORCE COEFFICIENT NORMAL DIRECTION



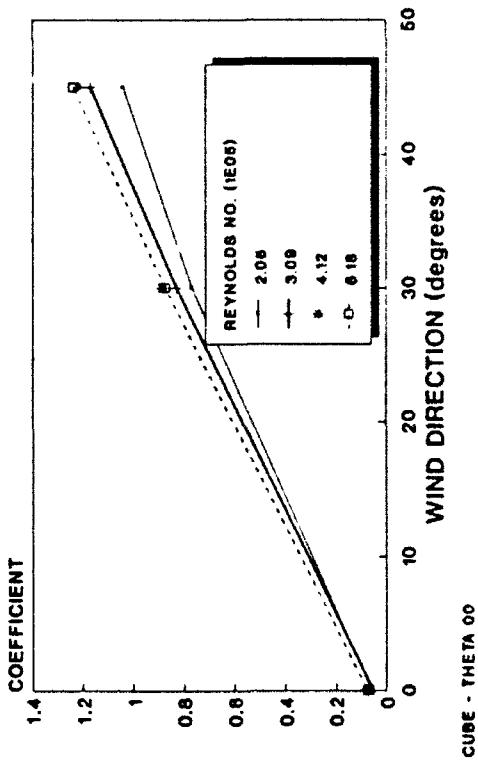
MEAN MOMENT COEFFICIENT NORMAL DIRECTION



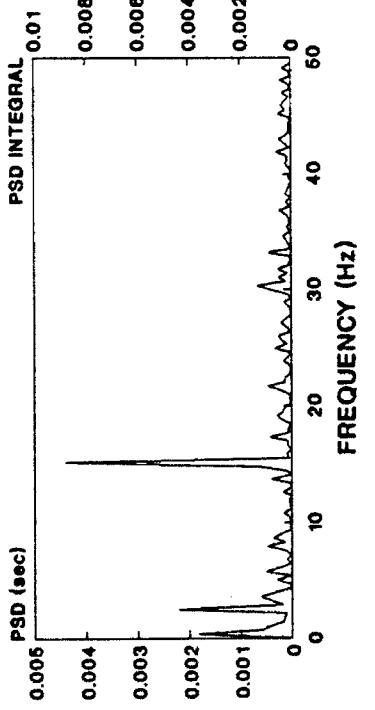
MEAN FORCE COEFFICIENT LATERAL DIRECTION



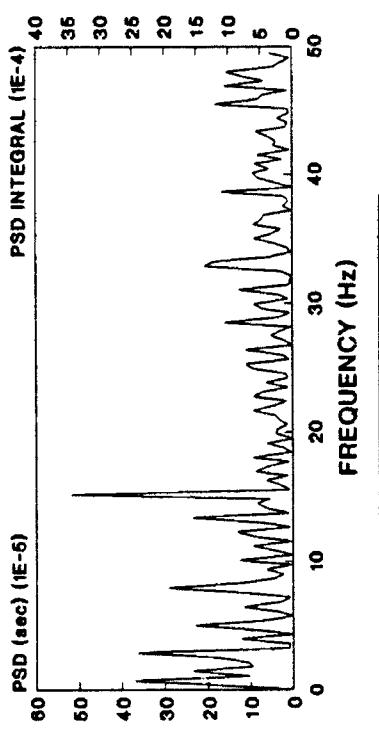
MEAN MOMENT COEFFICIENT LATERAL DIRECTION



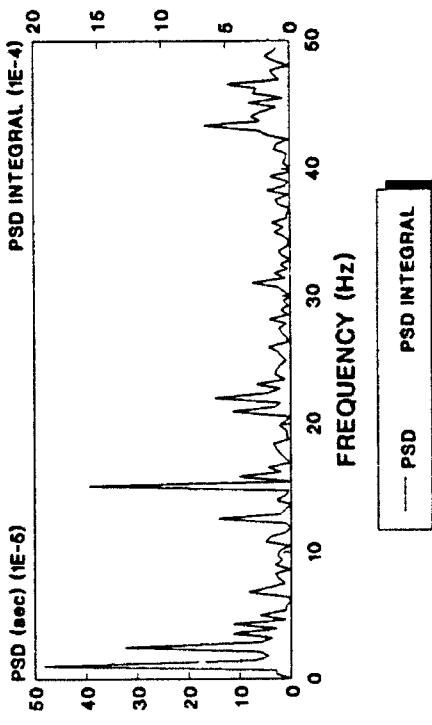
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



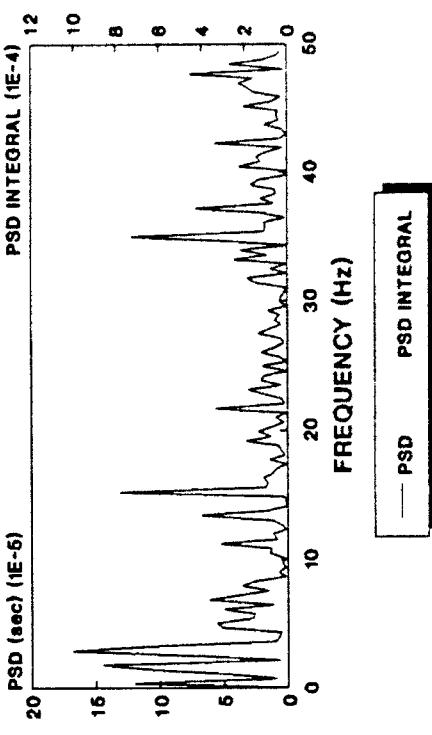
FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



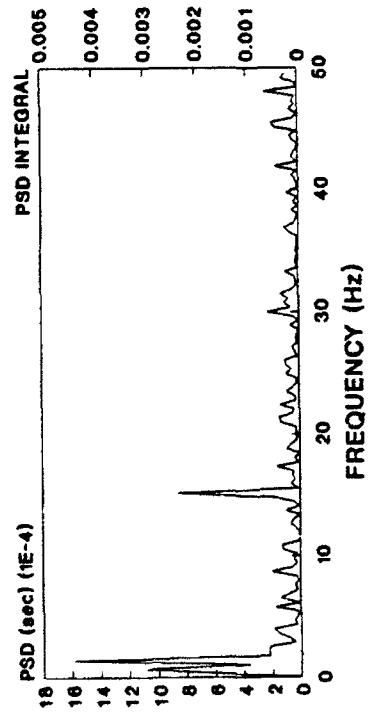
FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



FORCE COEFF - NORMAL 180 FT/SEC NOMINAL

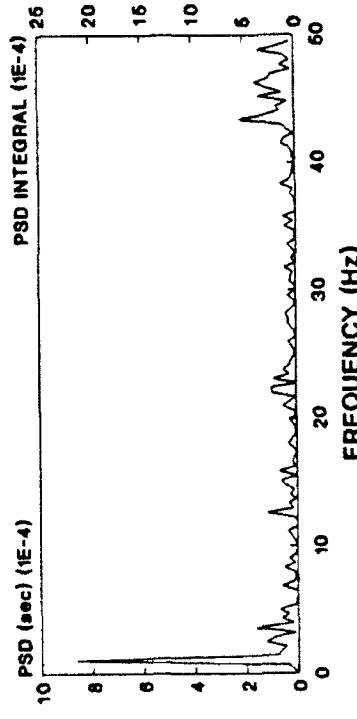


MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL



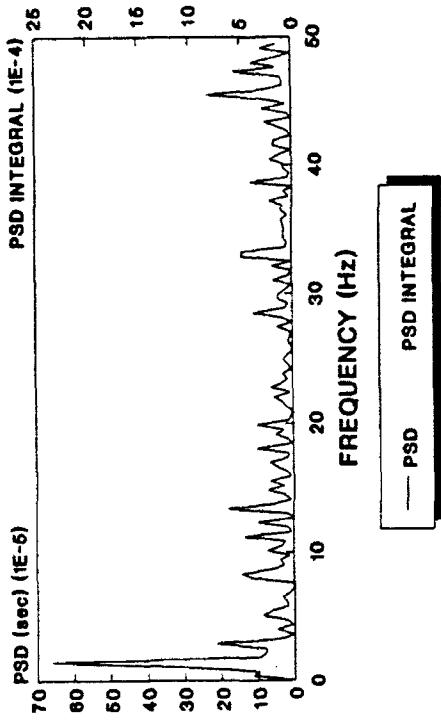
CUBE - THETA 00 - AZIMUTH - 000

MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL



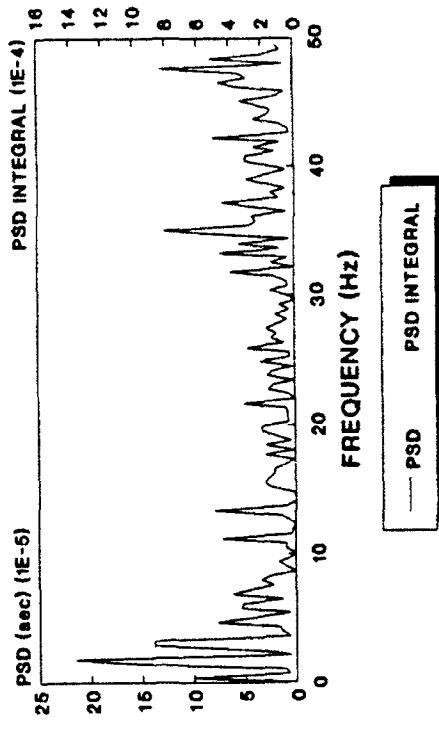
CUBE - THETA 00 - AZIMUTH - 000

MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL



CUBE - THETA 00 - AZIMUTH - 000

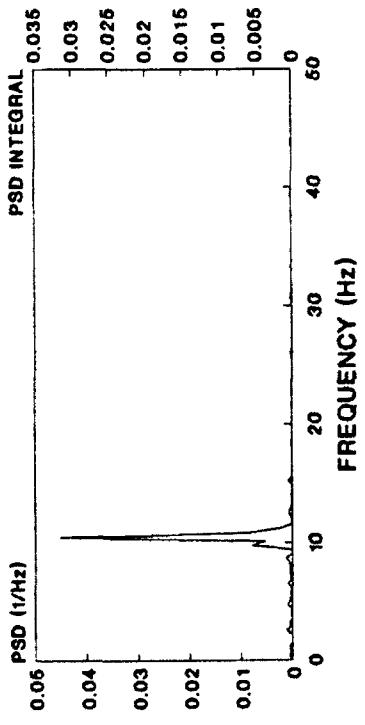
MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL



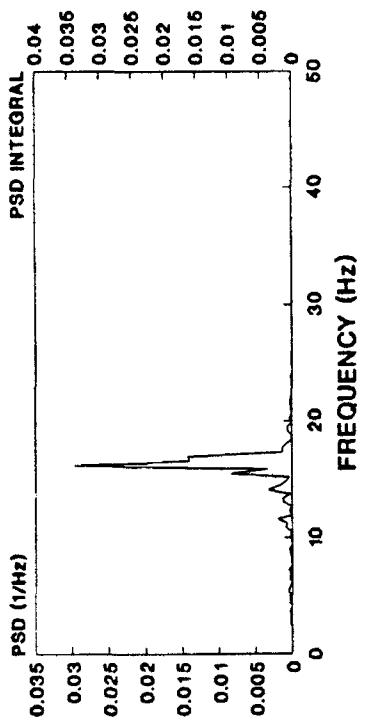
CUBE - THETA 00 - AZIMUTH - 000

CUBE - THETA 00 - AZIMUTH - 000

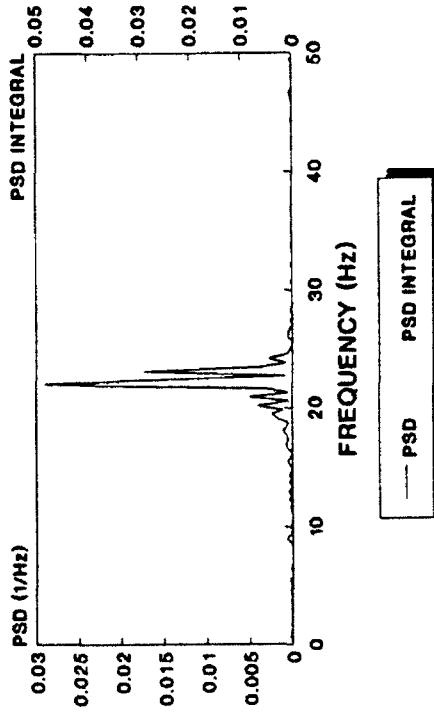
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



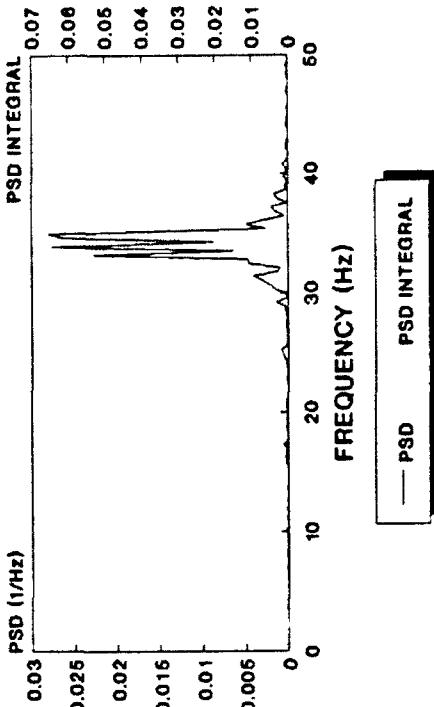
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



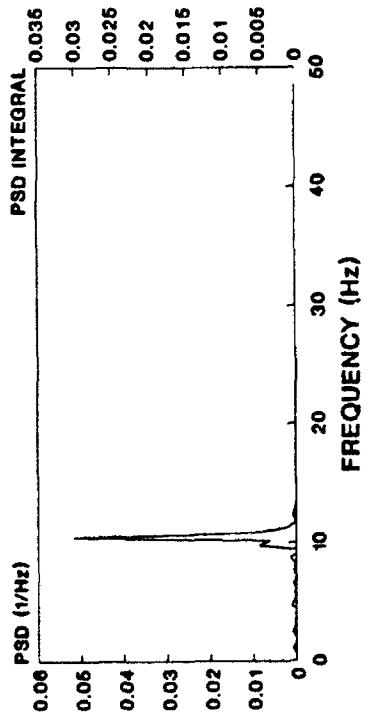
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



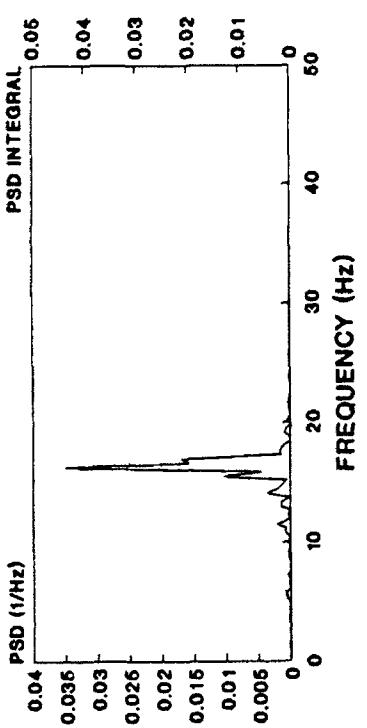
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



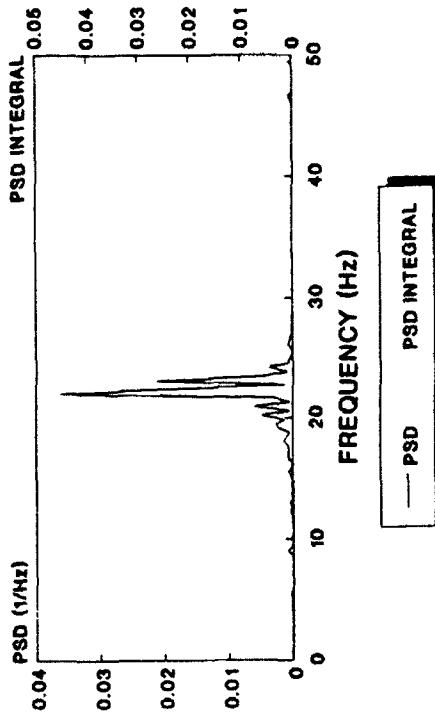
MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



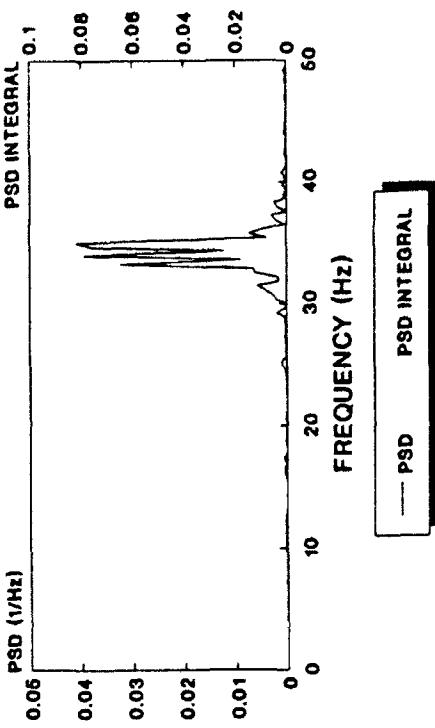
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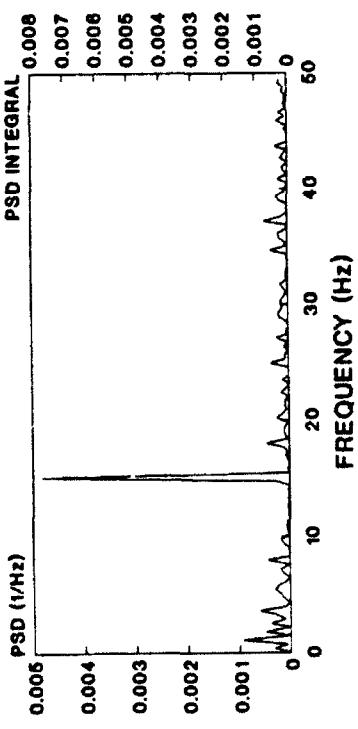
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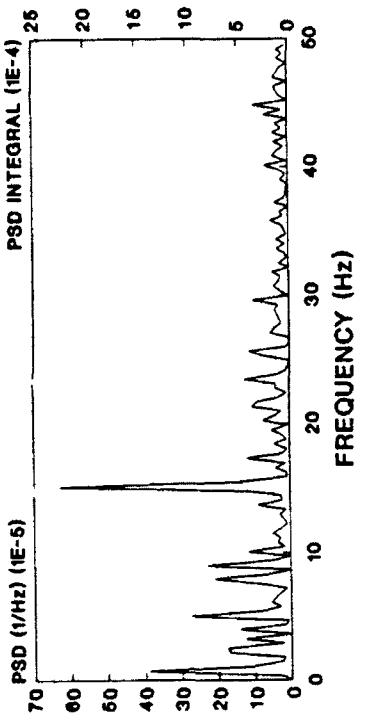
MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



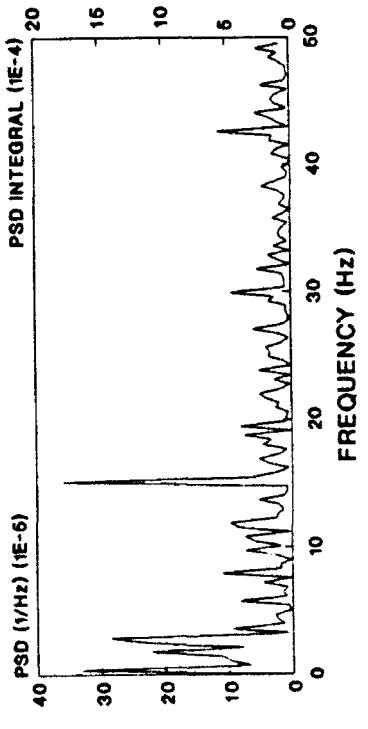
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



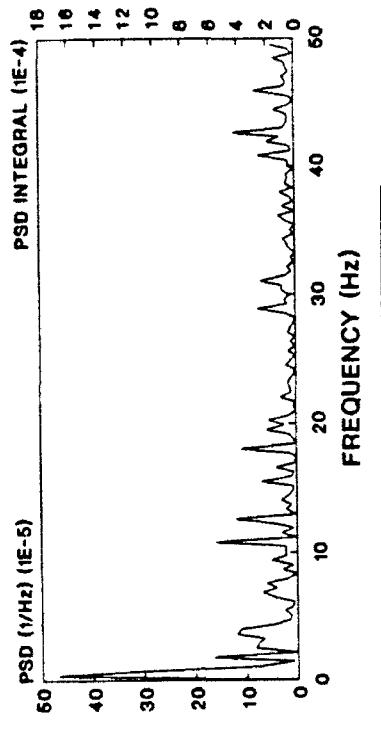
FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



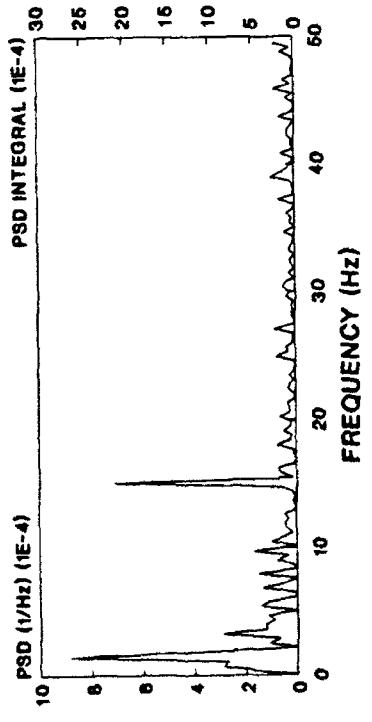
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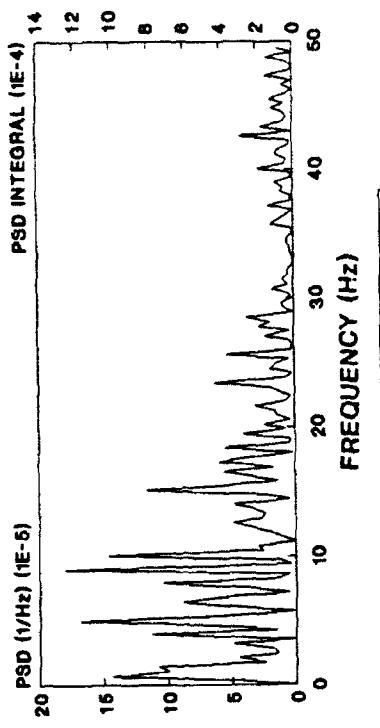
FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



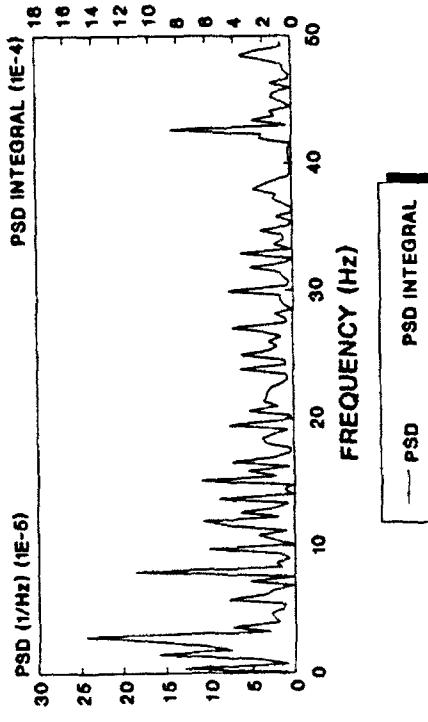
**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



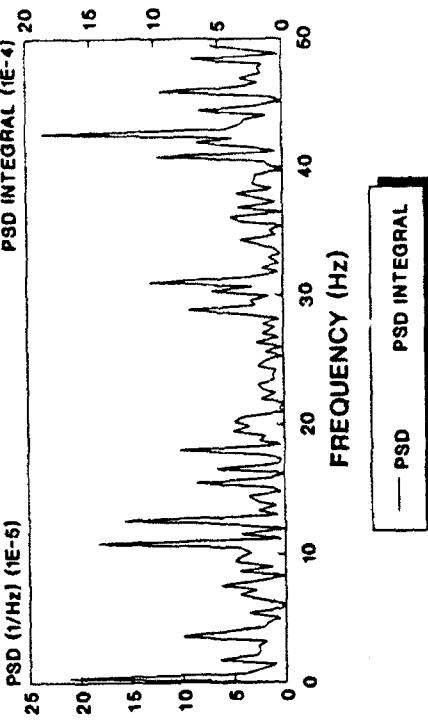
**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



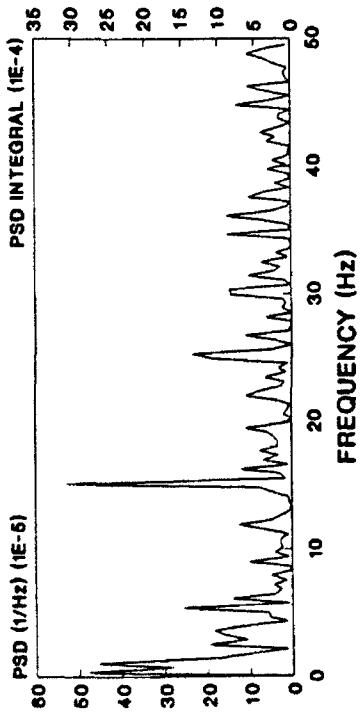
**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



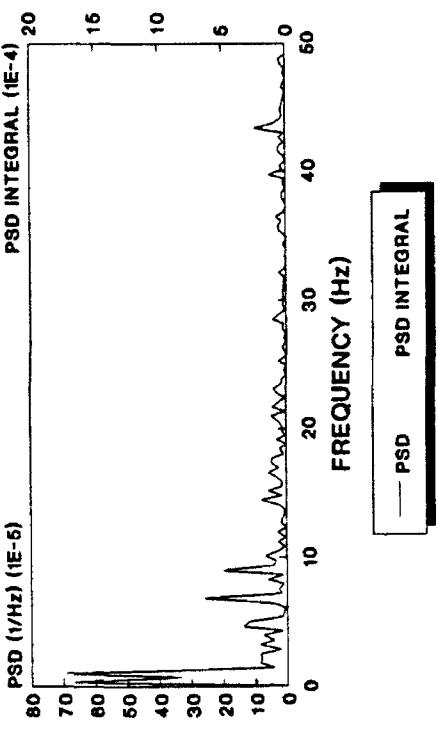
**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



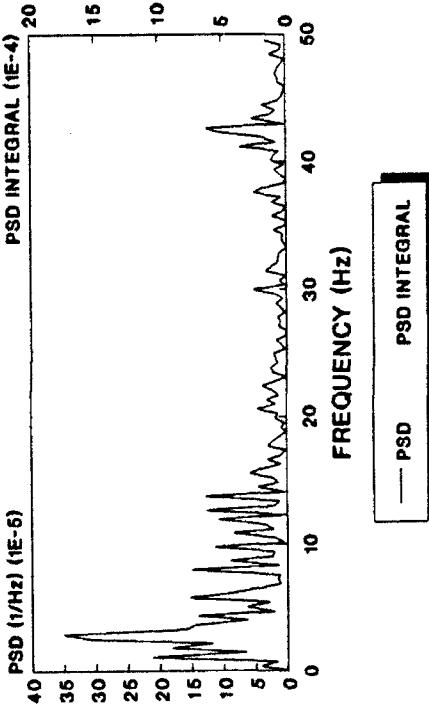
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



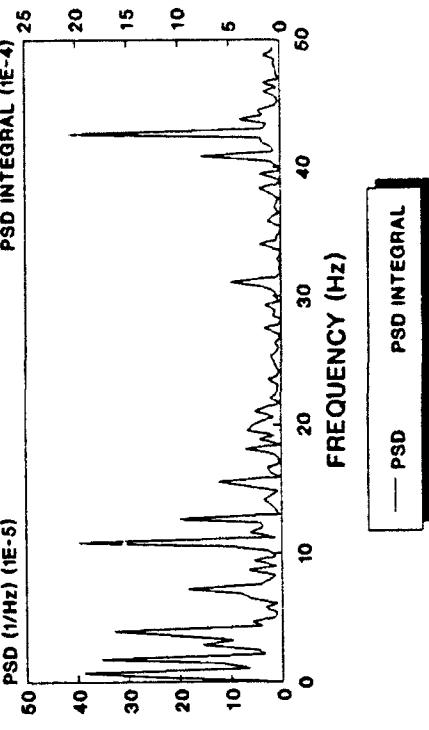
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



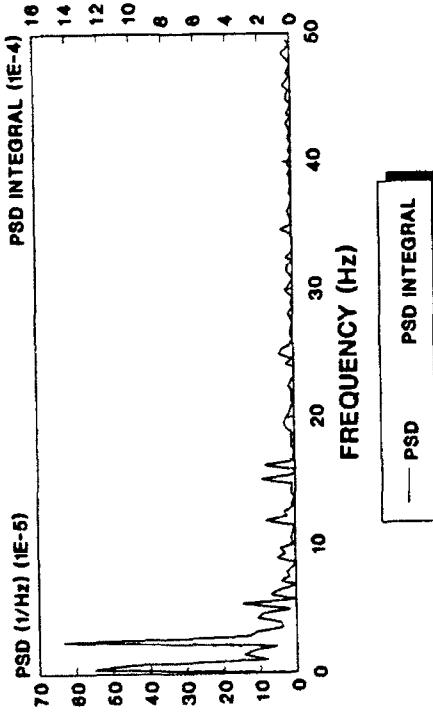
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



FORCE COEFF - LATERAL 180 FT/SEC NOMINAL

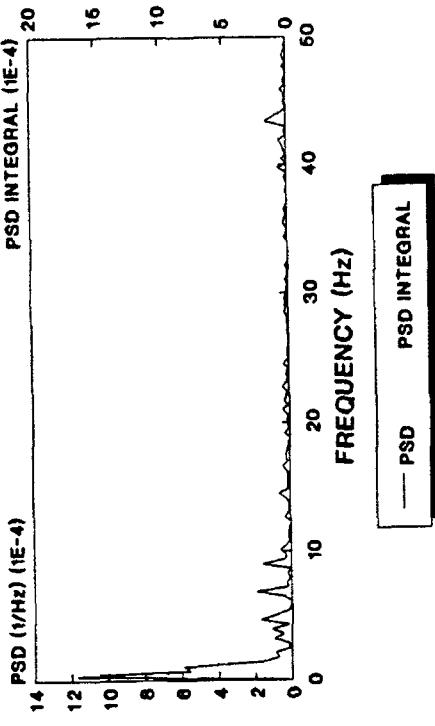


MOMENT COEFF - LATERAL
60 FT/SEC NOMINAL



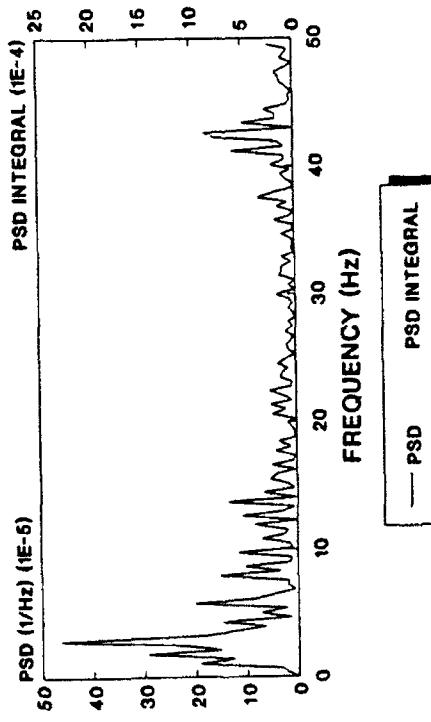
CUBE - THETA 00 - AZIMUTH - 030

MOMENT COEFF - LATERAL
90 FT/SEC NOMINAL



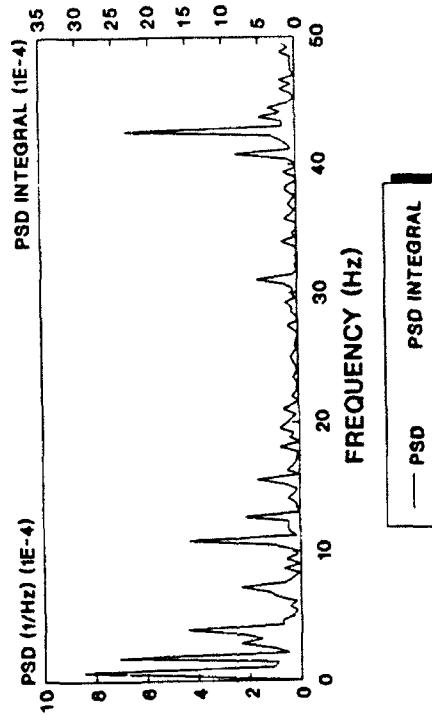
CUBE - THETA 00 - AZIMUTH - 030

MOMENT COEFF - LATERAL
120 FT/SEC NOMINAL



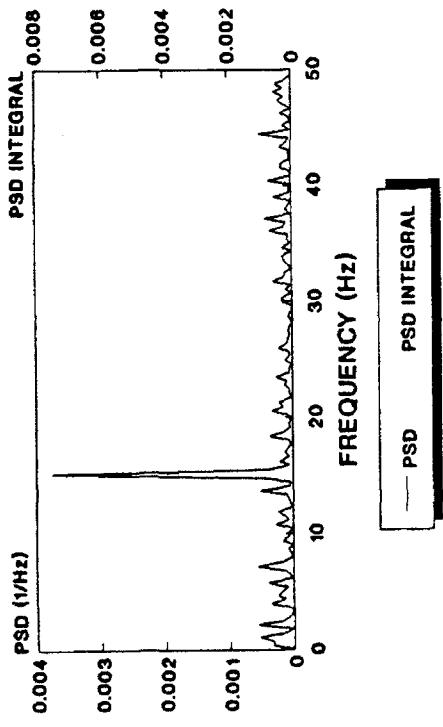
CHINESE - KOREAN - JAPANESE

MOMENT COEFF - LATERAL
180 FT/SEC NOMINAL

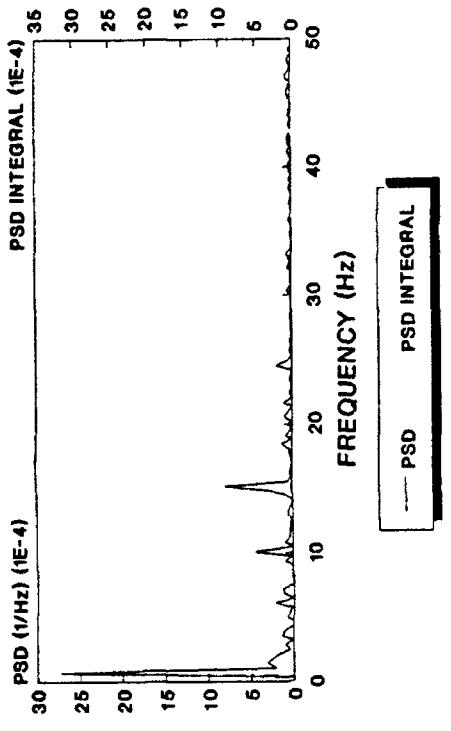


CUBE - THETA 00 - AZIMUTH - 030

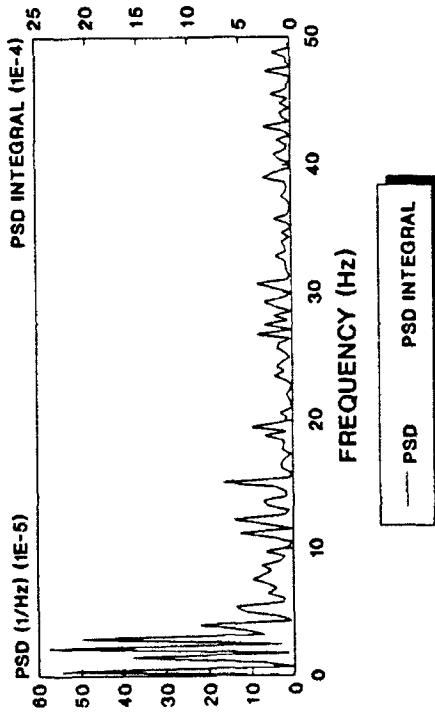
**FORCE COEFF - NORMAL
60 FT/SEC NOMINAL**



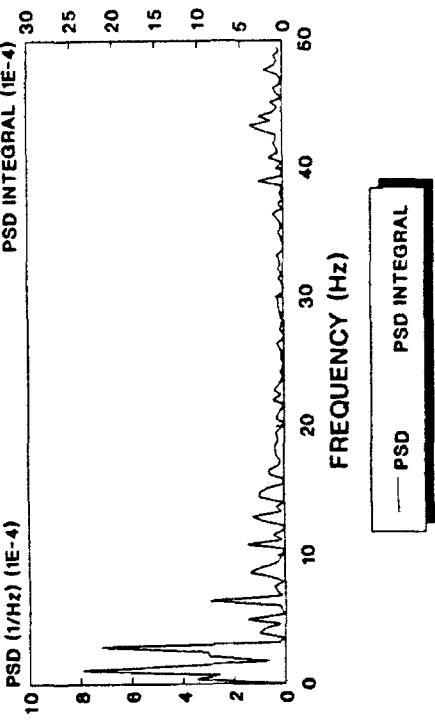
**FORCE COEFF - NORMAL
90 FT/SEC NOMINAL**



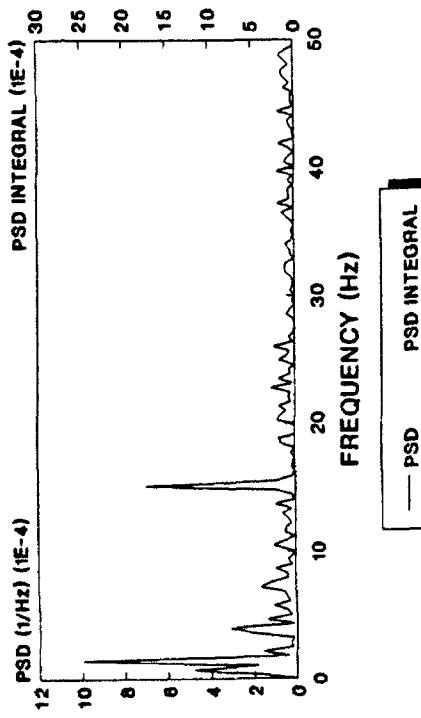
**FORCE COEFF - NORMAL
120 FT/SEC NOMINAL**



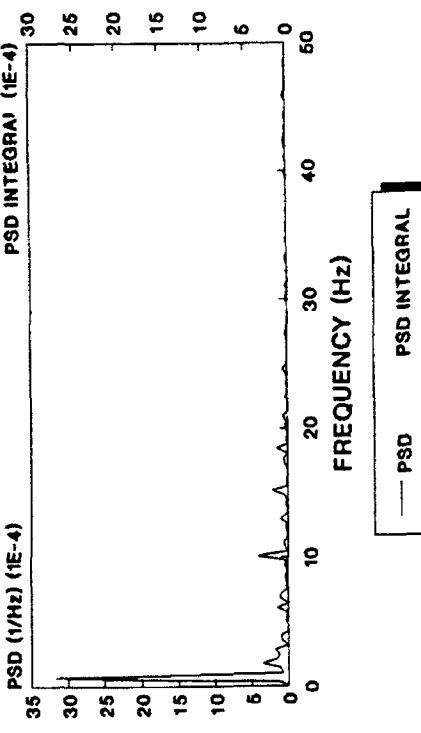
**FORCE COEFF - NORMAL
180 FT/SEC NOMINAL**



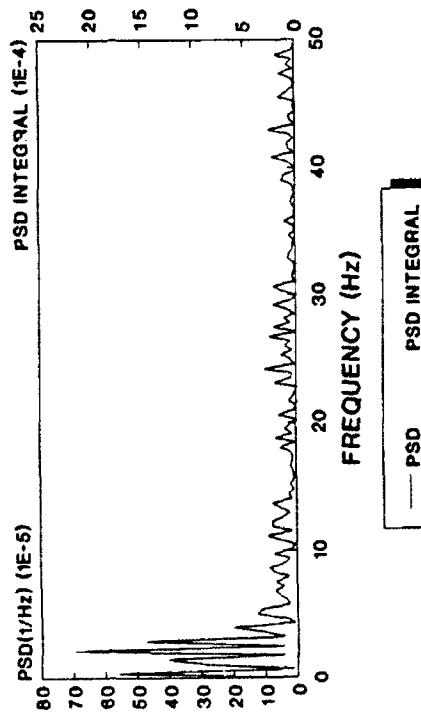
MOMENT COEFF - NORMAL 60 FT/SEC NOMINAL



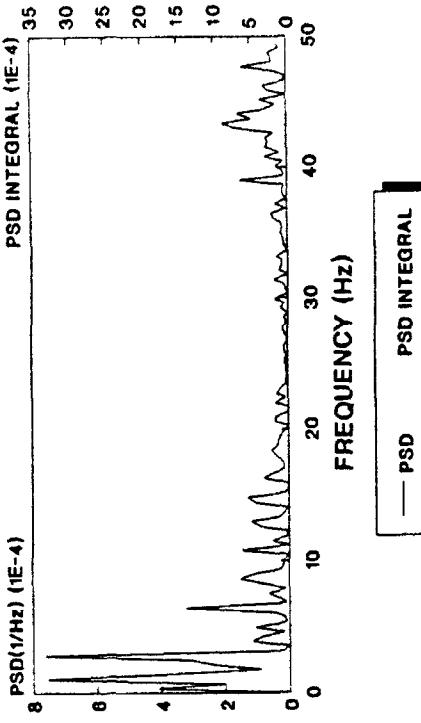
MOMENT COEFF - NORMAL 90 FT/SEC NOMINAL



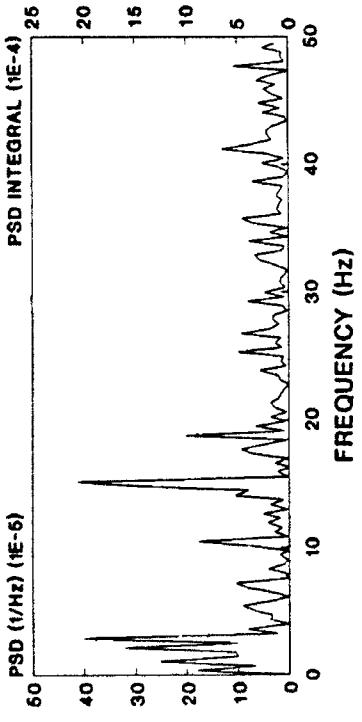
MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



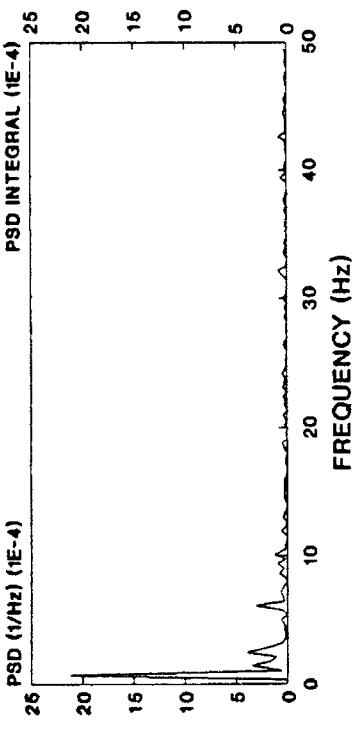
MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL



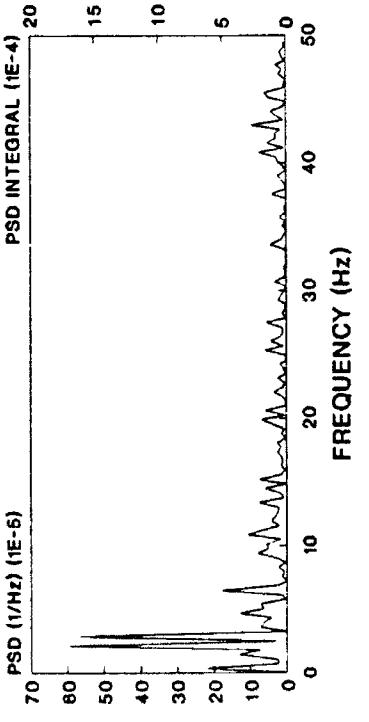
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



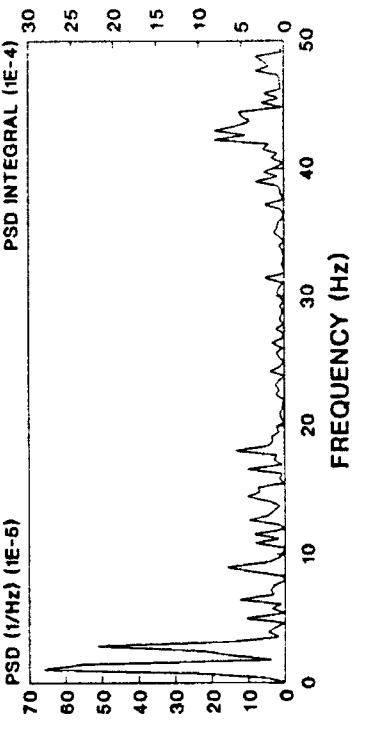
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



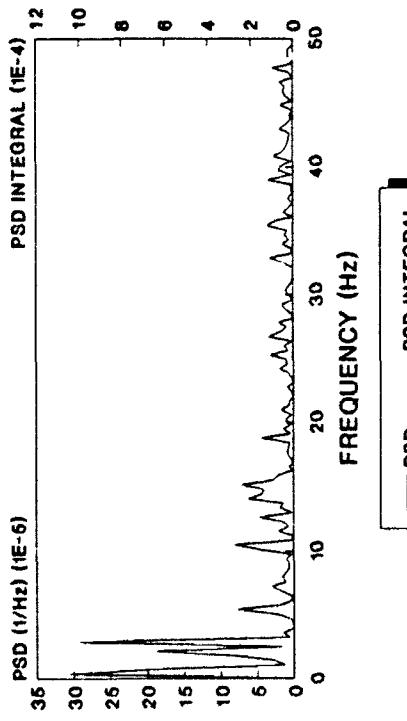
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



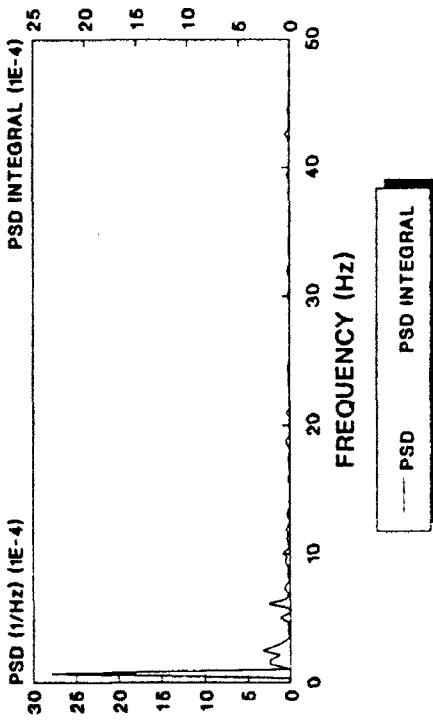
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



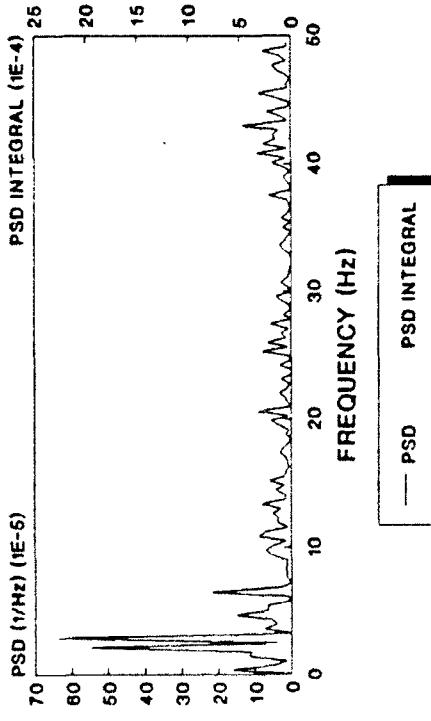
MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



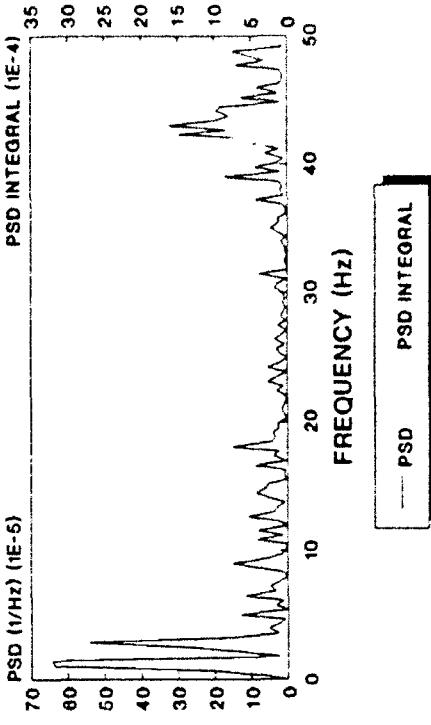
MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



DATA REPORT

SHAPE:	CUBE
DECLINATION [THETA (degrees)]:	30
DIMENSIONS [LxWxH (in)]:	9.0 x 7.7 x 8.5
WEIGHT (gm):	951.1
TORSION FREQUENCY (Hz):	34
LATERAL (SIDE BEND) FREQUENCY (Hz):	65
NORMAL (AFT BEND) FREQUENCY (Hz):	81
AZIMUTHS (degrees):	0, 30, 45, 60, 90 120, 135, 150, 180

GRAPH CORRECTIONS:

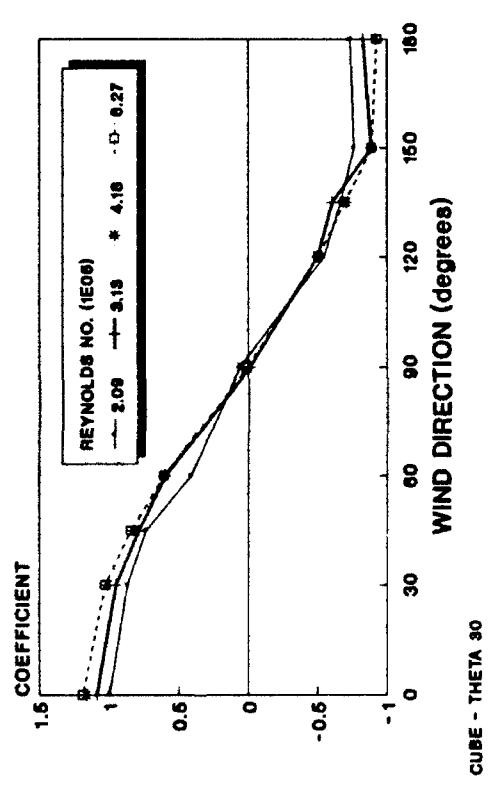
- The mean value of the **ROLL** moment coefficients should be divided by 12.
- The PSD and PSD Integral values of the **ROLL** moment coefficients should be divided by 144.

OBSERVATIONS:

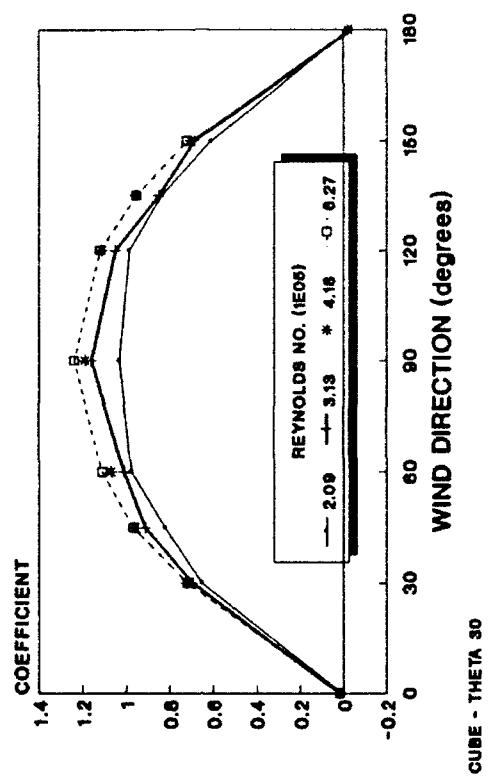
- Very good shedding is seen in the normal data at 90 degrees azimuth. This shedding is nearly single frequency in nature. This shed can be seen in the roll data as well but a dominating frequency near 39 Hz makes it difficult to see.
- A large frequency spike near 39 - 40 Hz is seen in much of the data.
- Good multifrequency shed can be seen in the lateral data at 30 degrees azimuth. However it is over shadowed by the system resonance at 39 - 40 Hz. Good multifrequency shedding can be seen in much of the data at 120, 135, and 150 degrees azimuth.

- A poor shed is seen in the lateral data at an azimuth of 0 degrees and in the lateral and roll data at 180 degrees. The shed at 0 degrees is more noticeable in spite of the noisy signal.

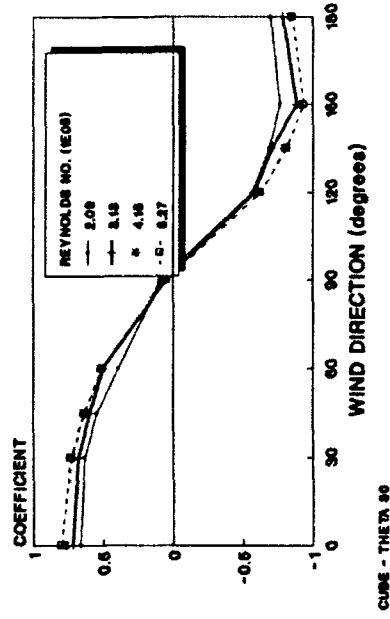
MEAN FORCE COEFFICIENT NORMAL DIRECTION



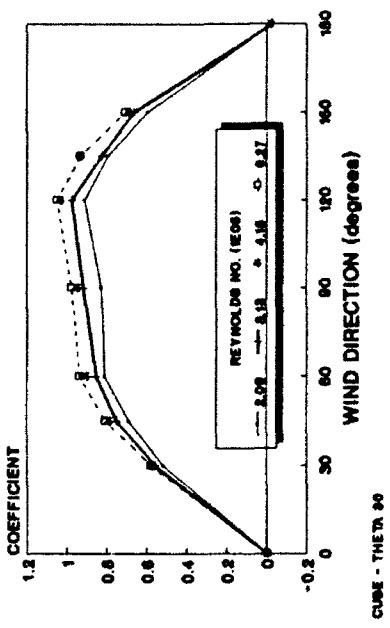
MEAN FORCE COEFFICIENT LATERAL DIRECTION



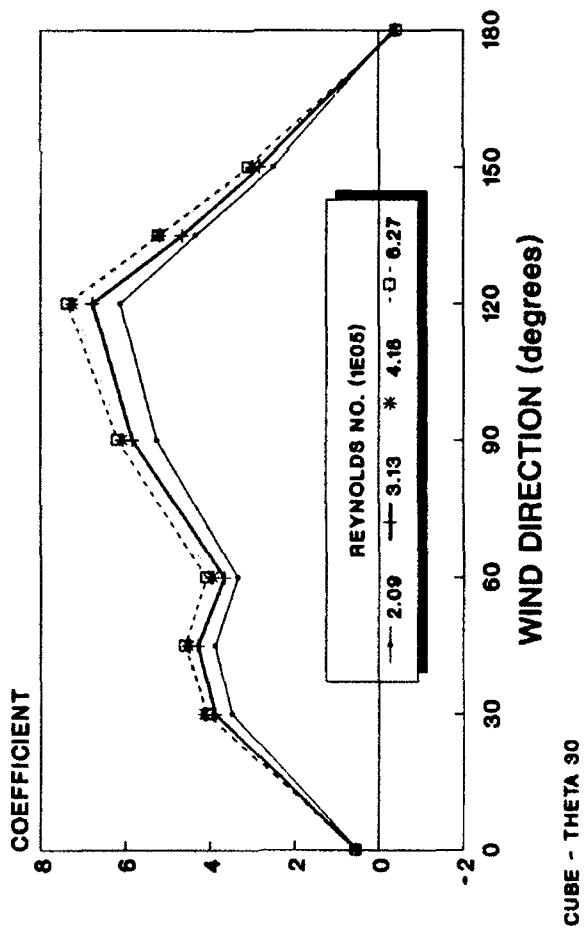
MEAN MOMENT COEFFICIENT NORMAL DIRECTION



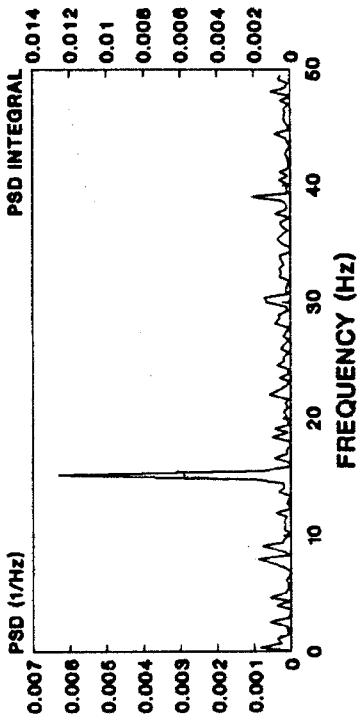
MEAN MOMENT COEFFICIENT LATERAL DIRECTION



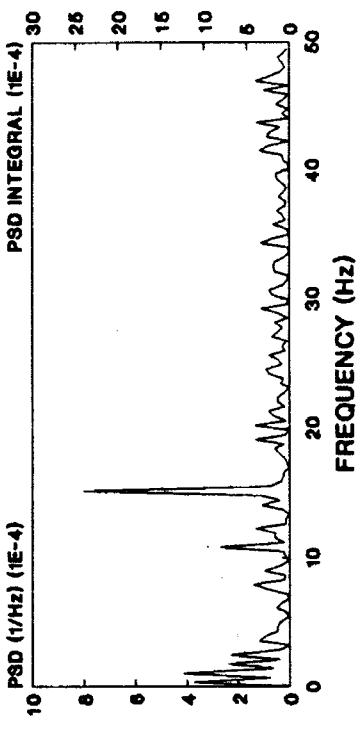
MEAN MOMENT COEFFICIENT ROLL DIRECTION



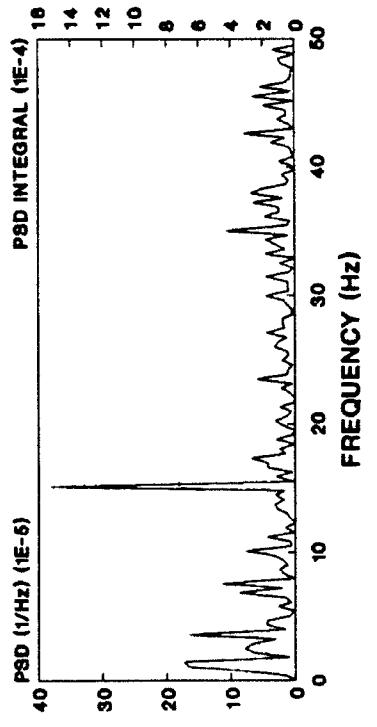
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



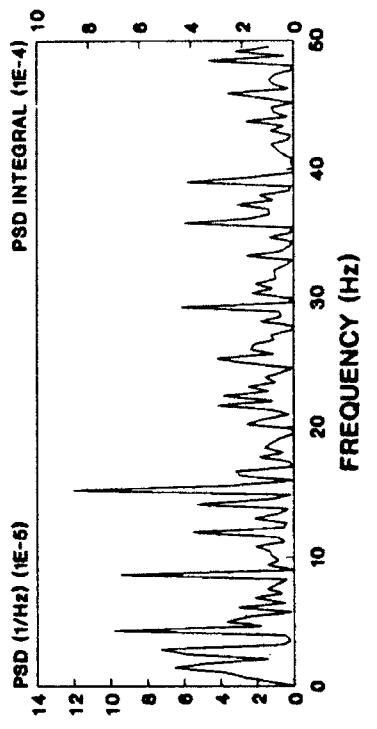
FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



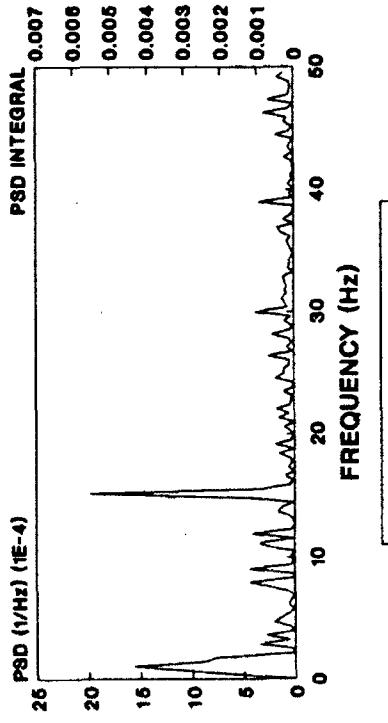
FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



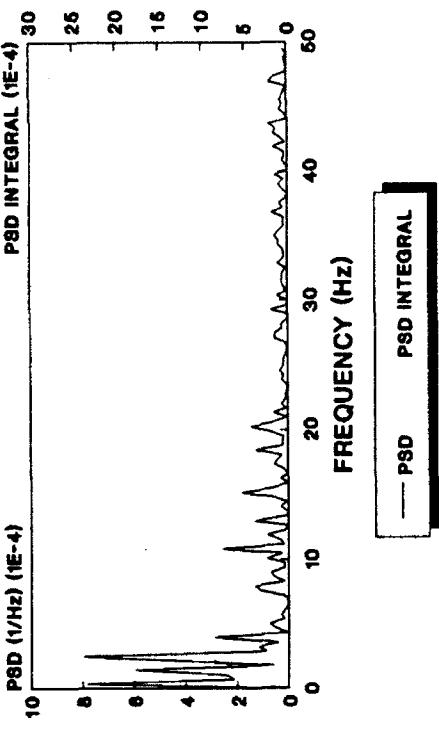
FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



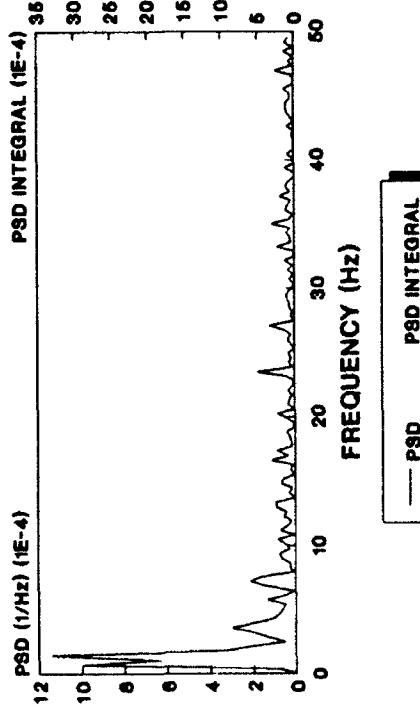
MOMENT COEFF - NORMAL 60 FT/SEC NOMINAL



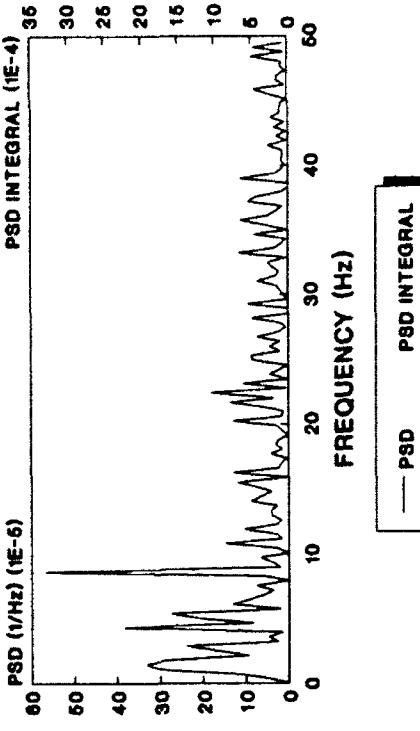
MOMENT COEFF - NORMAL 90 FT/SEC NOMINAL



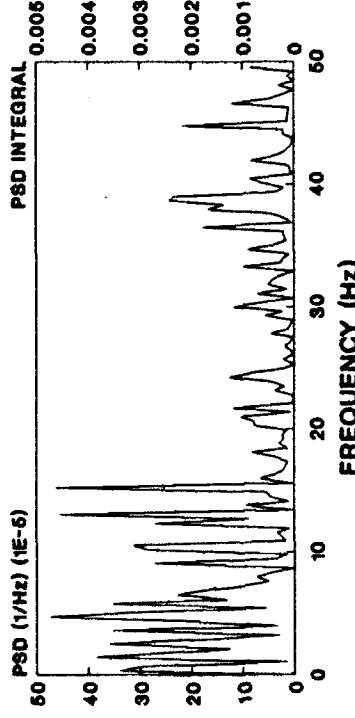
MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL

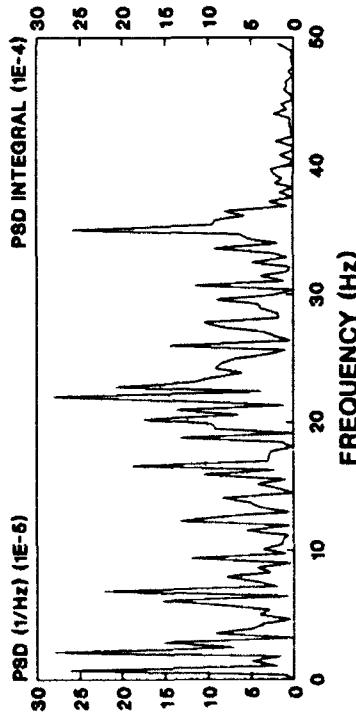


FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



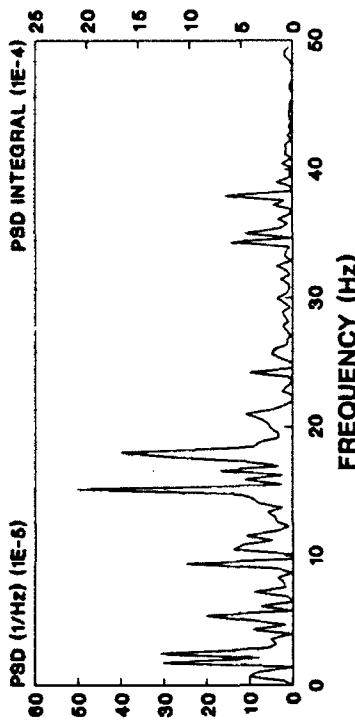
CUBE - HT 8.6 - THETA 30 - AZ 000

FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



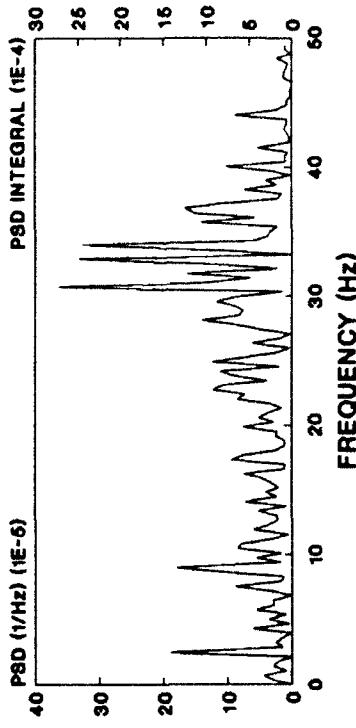
CUBE - HT 8.6 - THETA 30 - AZ 000

FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



CUBE - HT 8.6 - THETA 30 - AZ 000

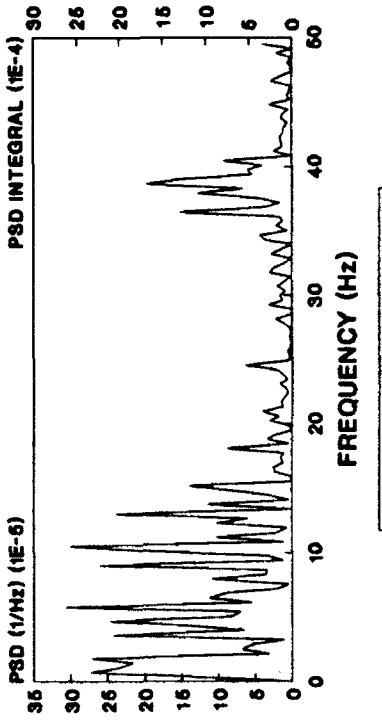
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



CUBE - HT 8.6 - THETA 30 - AZ 000

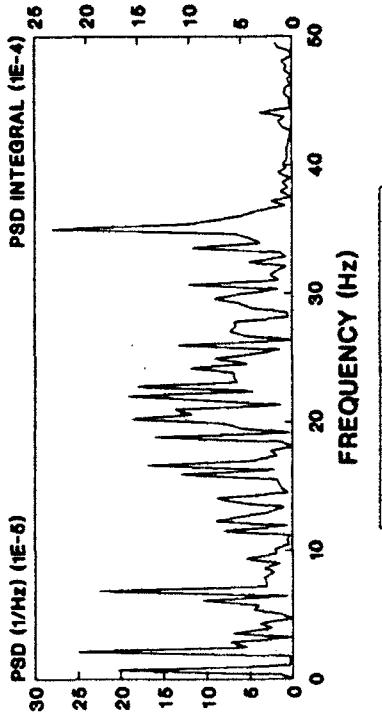
CUBE - HT 8.6 - THETA 30 - AZ 000

MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



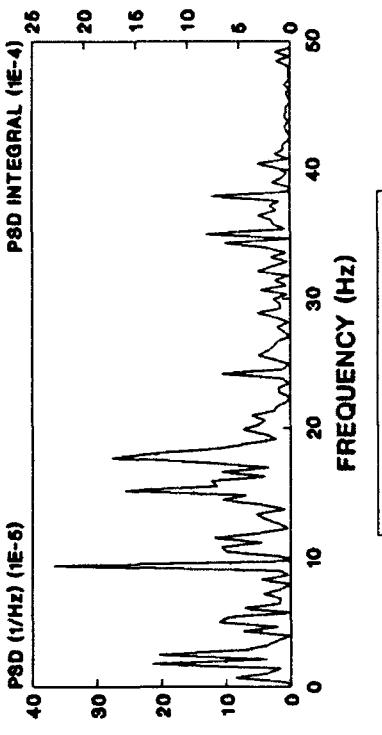
CUBE - HT 8.6 - THETA 30 - AZ 000

MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



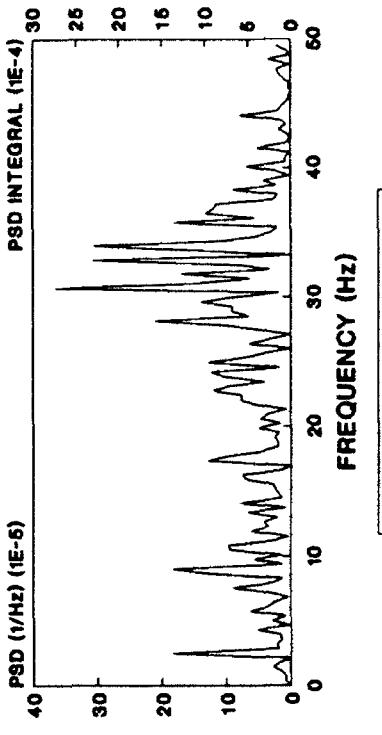
CUBE - HT 8.6 - THETA 30 - AZ 000

MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



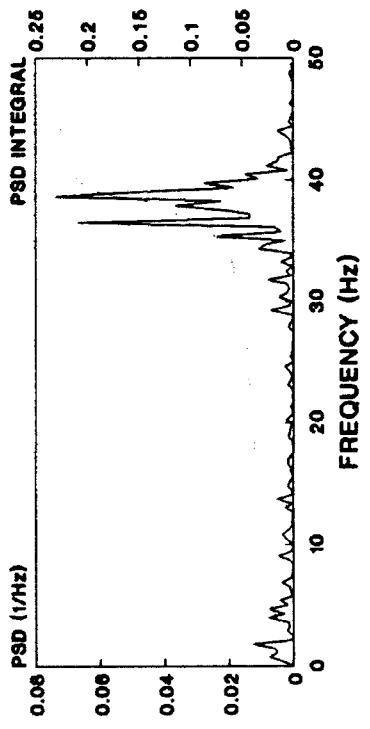
CUBE - HT 8.6 - THETA 30 - AZ 000

MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



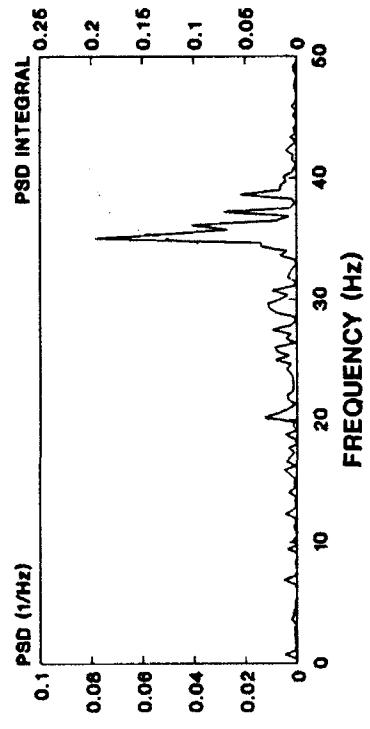
CUBE - HT 8.6 - THETA 30 - AZ 000

MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



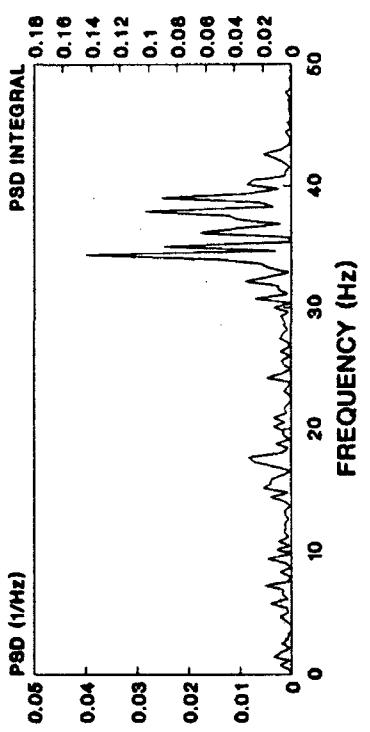
CUBE - HT 8.6 - THETA 30 - AZ 000

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



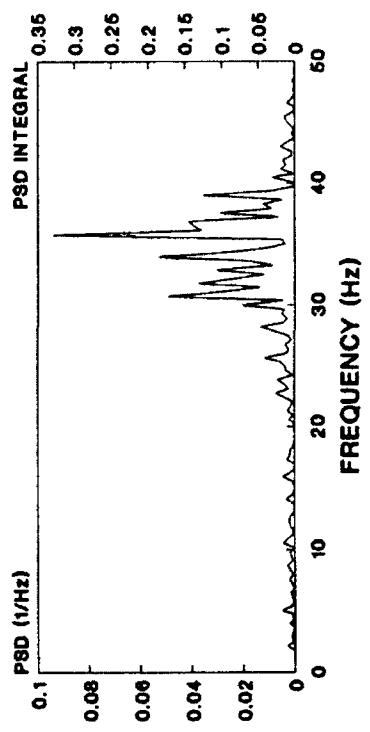
CUBE - HT 8.6 - THETA 30 - AZ 000

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



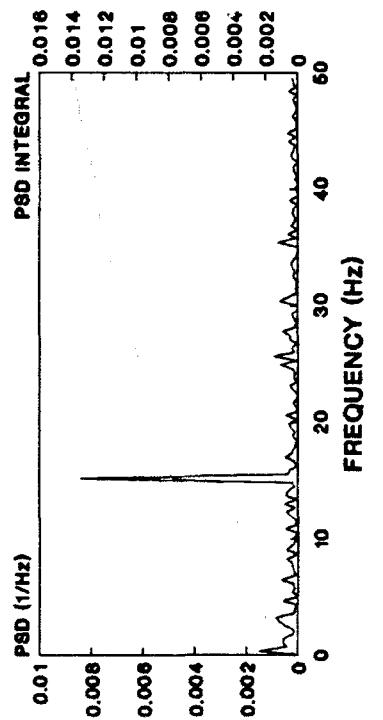
CUBE - HT 8.6 - THETA 30 - AZ 000

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

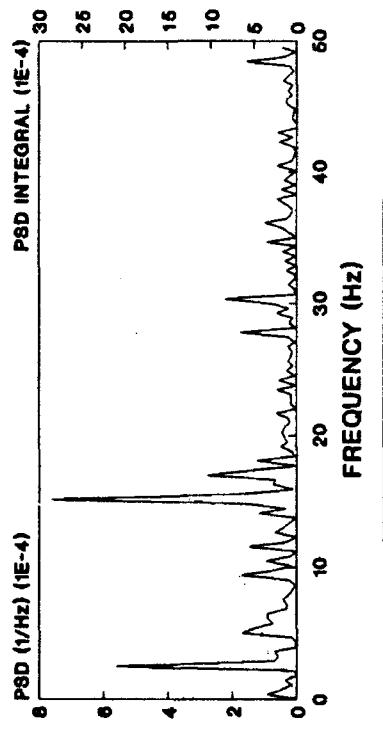


CUBE - HT 8.6 - THETA 30 - AZ 000

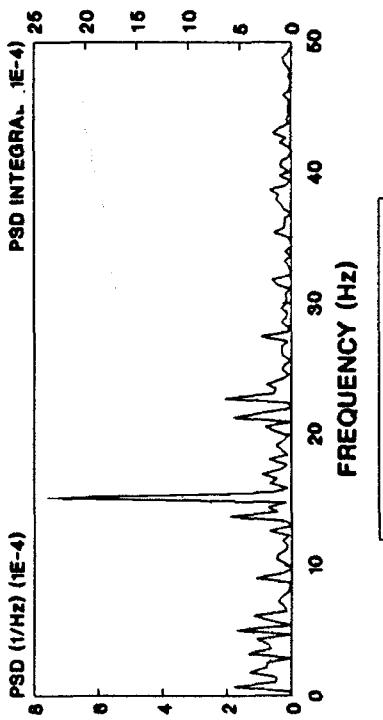
**FORCE COEFF - NORMAL
60 FT/SEC NOMINAL**



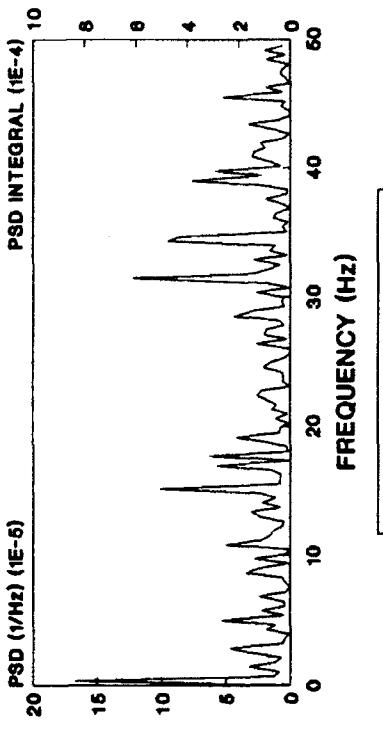
**FORCE COEFF - NORMAL
90 FT/SEC NOMINAL**



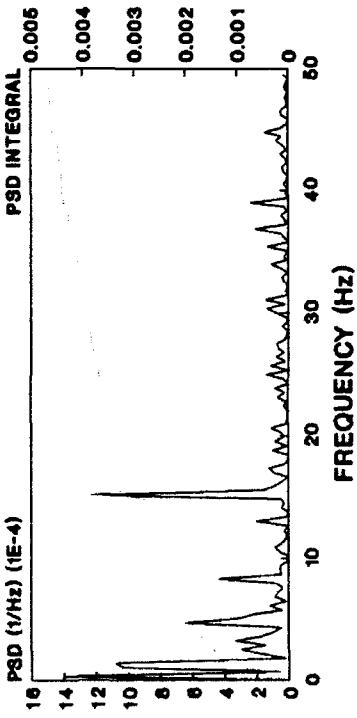
**FORCE COEFF - NORMAL
120 FT/SEC NOMINAL**



**FORCE COEFF - NORMAL
180 FT/SEC NOMINAL**

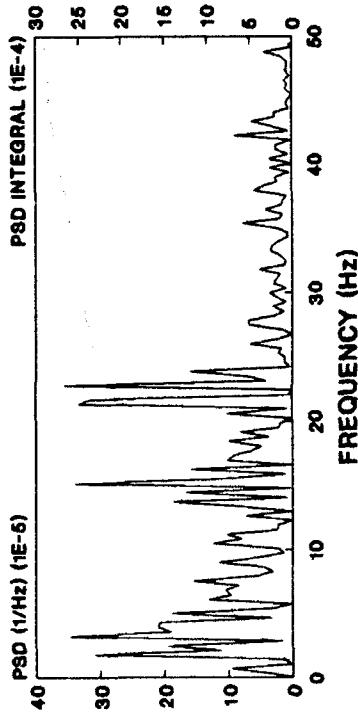


MOMENT COEFF - NORMAL 60 FT/SEC NOMINAL



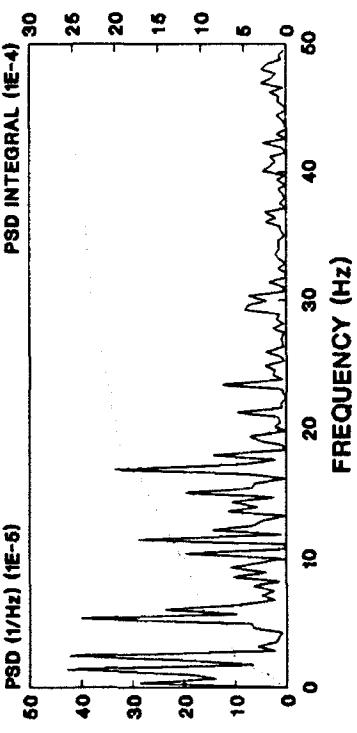
CUBE - HT 8.5 - THETA 30 - AZ 030

MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



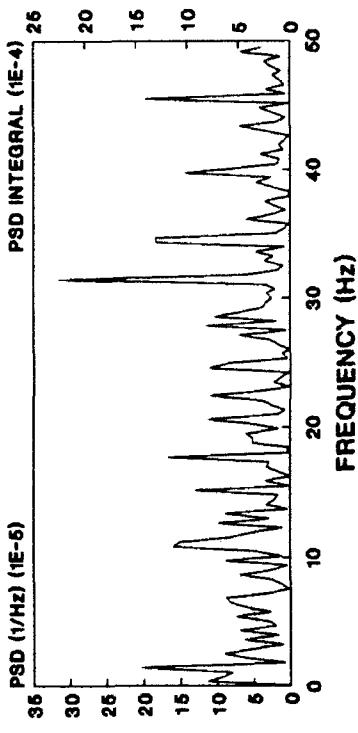
CUBE - HT 8.5 - THETA 30 - AZ 030

MOMENT COEFF - NORMAL 90 FT/SEC NOMINAL



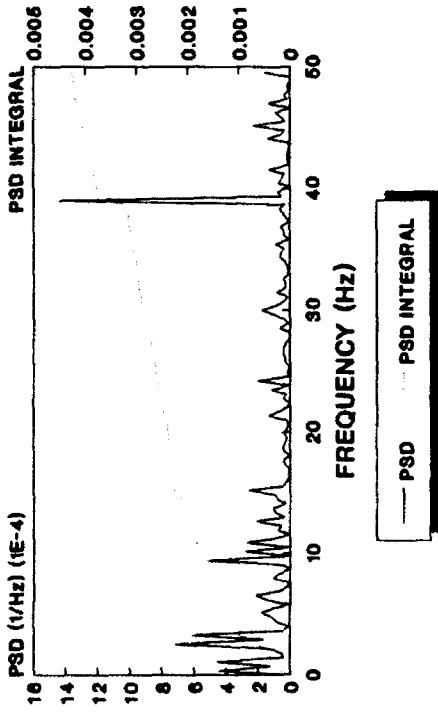
CUBE - HT 8.5 - THETA 30 - AZ 030

MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL



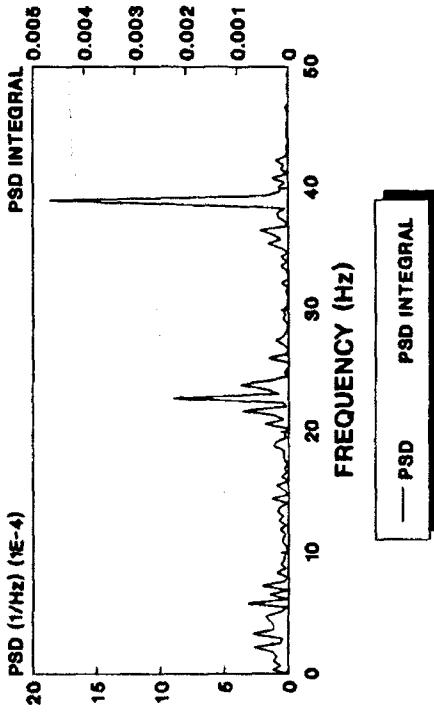
CUBE - HT 8.5 - THETA 30 - AZ 030

FORCE COEFF - LATERAL
60 FT/SEC NOMINAL



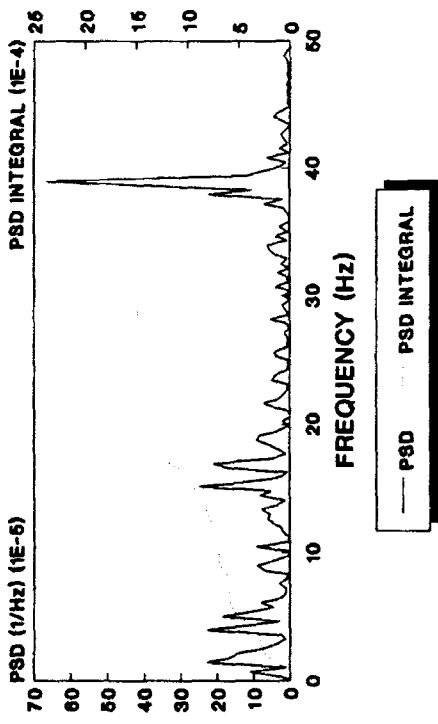
CUBE - HT 0.6 - THETA 30 - AZ 030

FORCE COEFF - LATERAL
120 FT/SEC NOMINAL



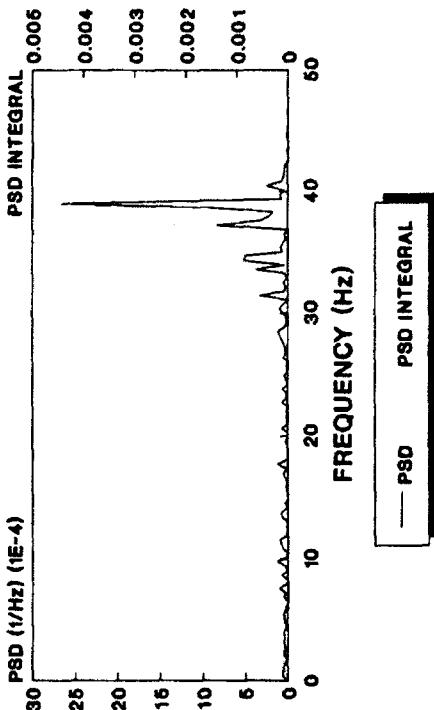
CUBE - HT 0.5 - THETA 30 - AZ 030

FORCE COEFF - LATERAL
90 FT/SEC NOMINAL



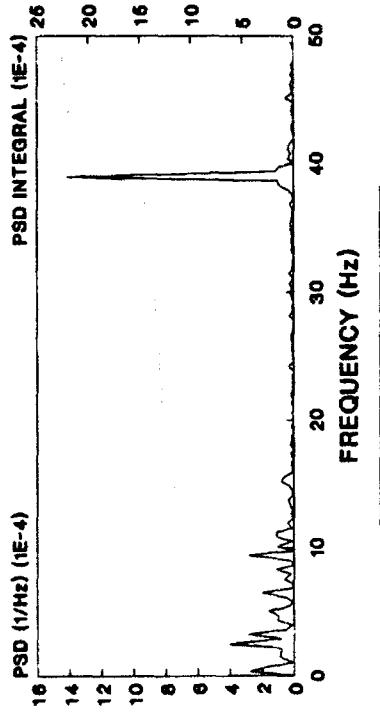
CUBE - HT 0.6 - THETA 30 - AZ 030

FORCE COEFF - LATERAL
180 FT/SEC NOMINAL

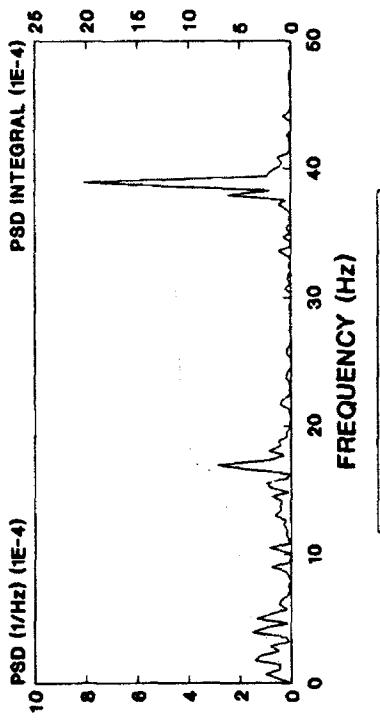


CUBE - HT 0.6 - THETA 30 - AZ 030

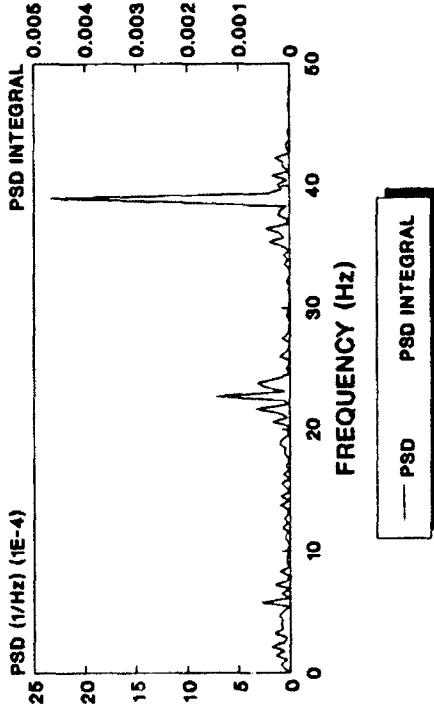
MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



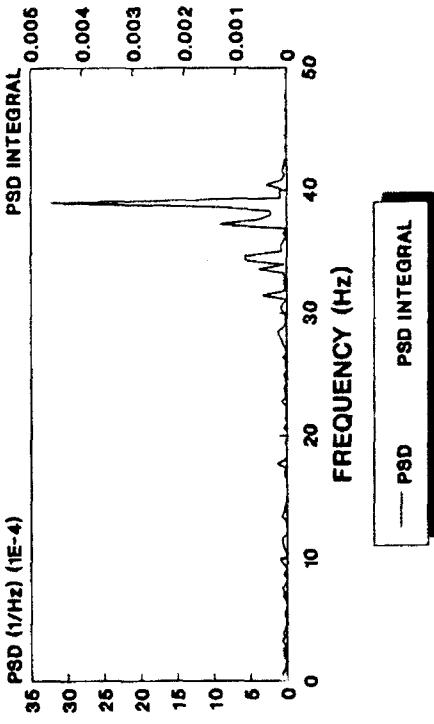
MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



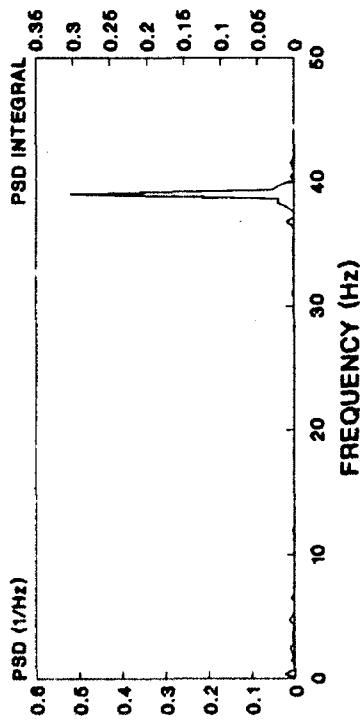
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL

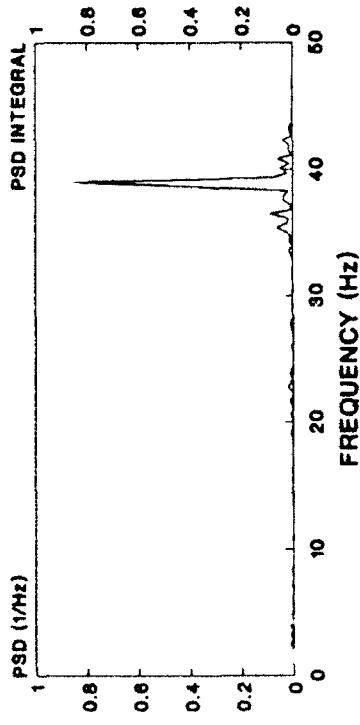


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



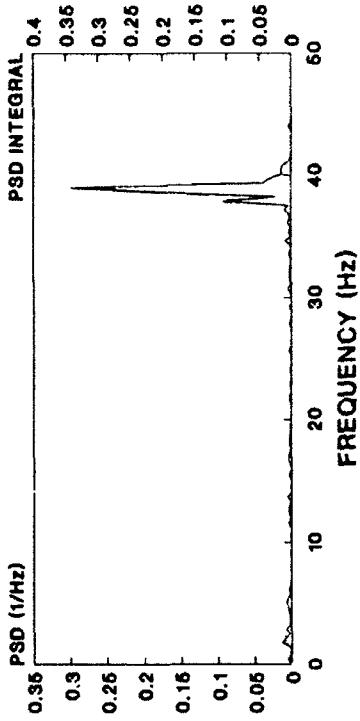
CUBE - HT 6.6 - THETA 30 - AZ 030

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



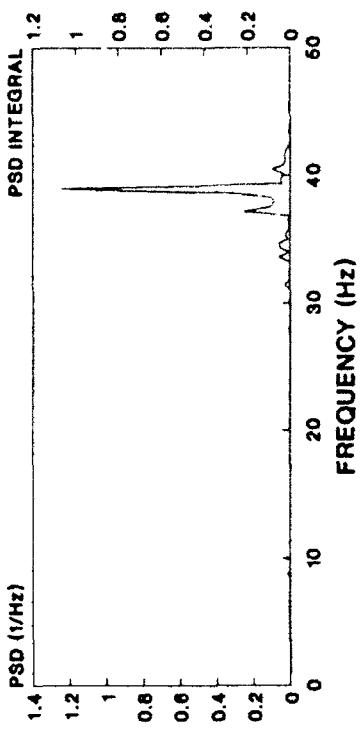
CUBE - HT 6.6 - THETA 30 - AZ 030

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



CUBE - HT 6.6 - THETA 30 - AZ 030

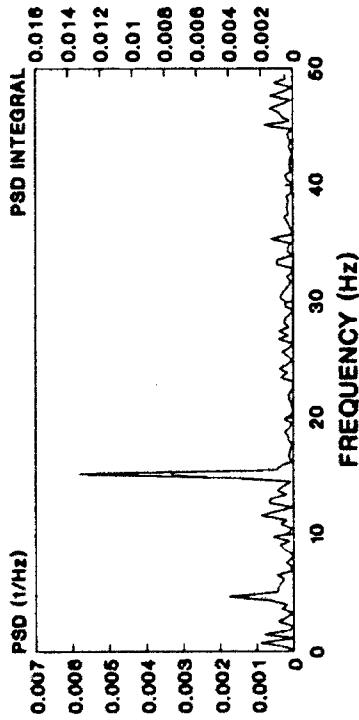
MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



CUBE - HT 6.6 - THETA 30 - AZ 030

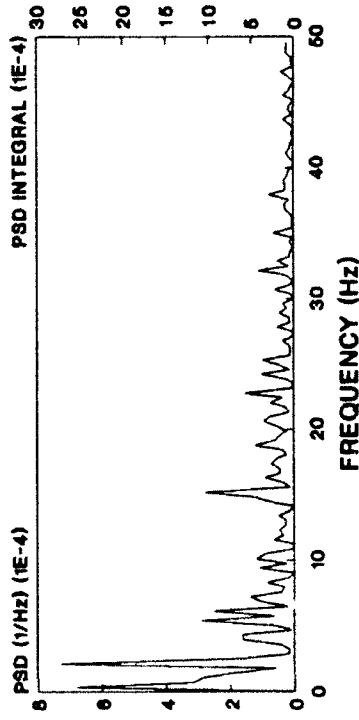
CUBE - HT 6.6 - THETA 30 - AZ 030

FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



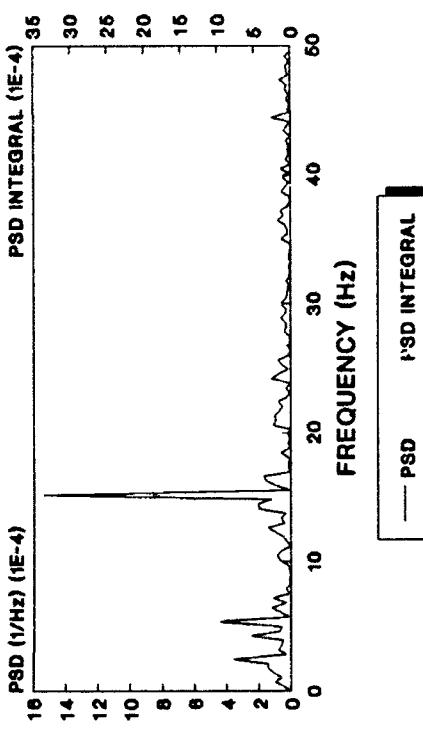
CUBE - HT 8.6 - THETA 30 - AZ 046

FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



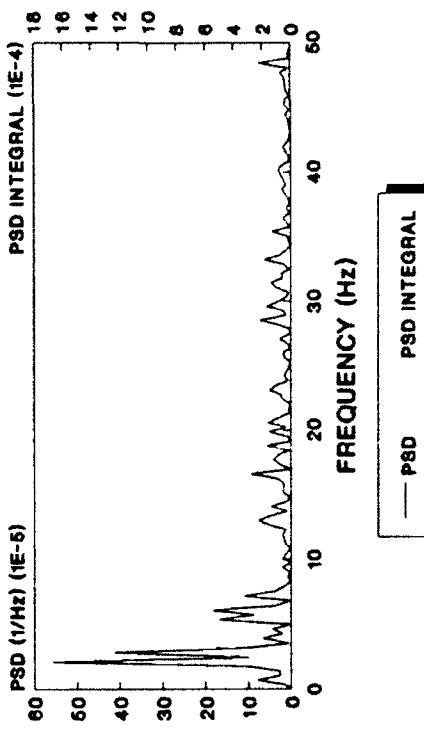
CUBE - HT 8.6 - THETA 30 - AZ 046

FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



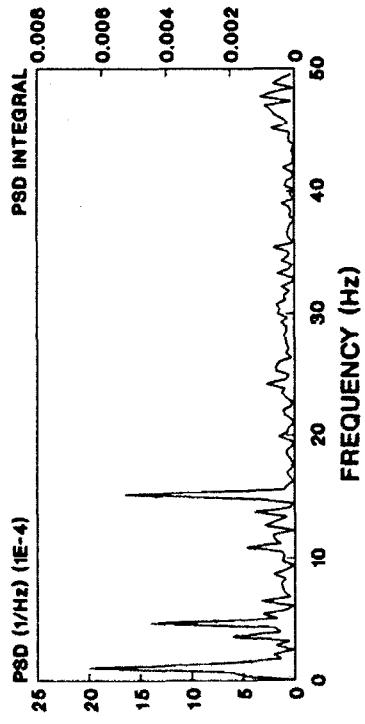
CUBE - HT 8.6 - THETA 30 - AZ 046

FORCE COEFF - NORMAL 180 FT/SEC NOMINAL

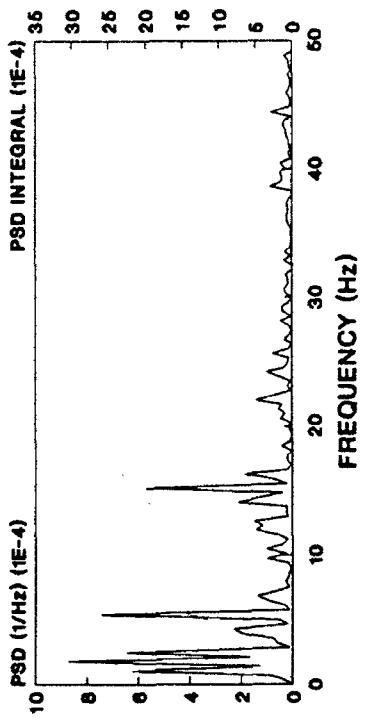


CUBE - HT 8.6 - THETA 30 - AZ 046

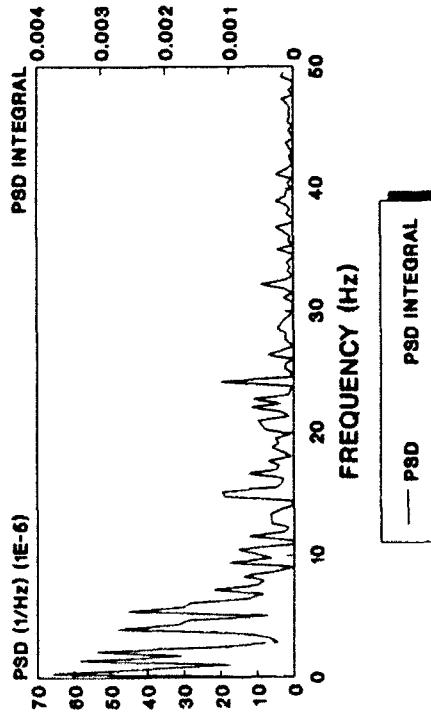
MOMENT COEFF - NORMAL 60 FT/SEC NOMINAL



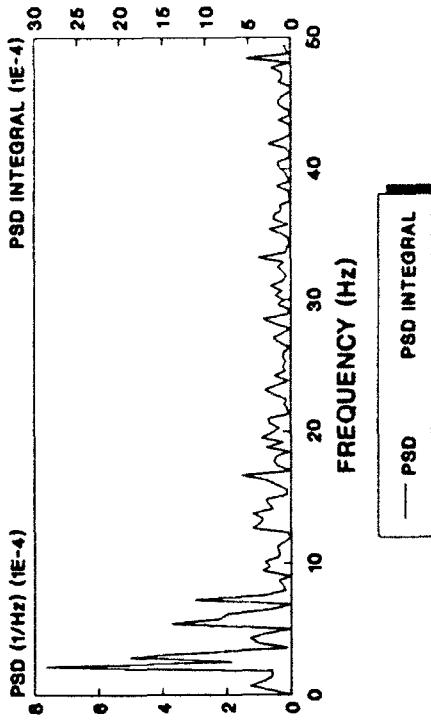
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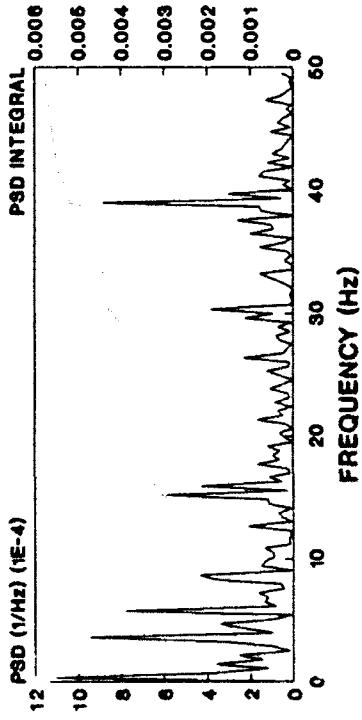
MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



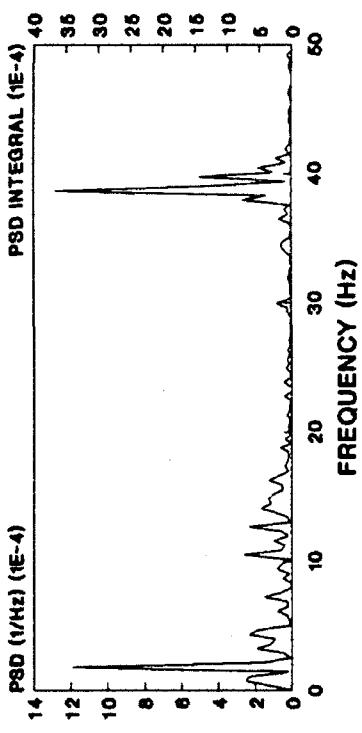
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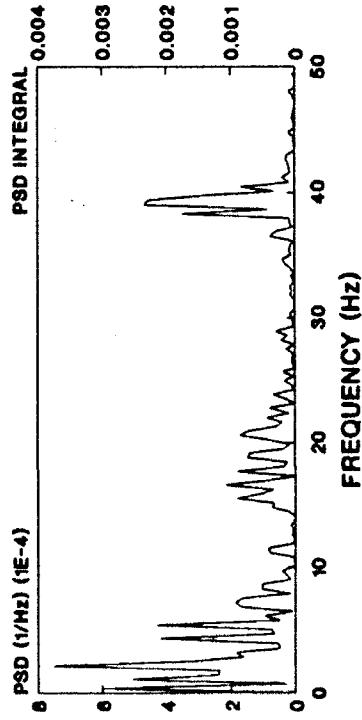
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



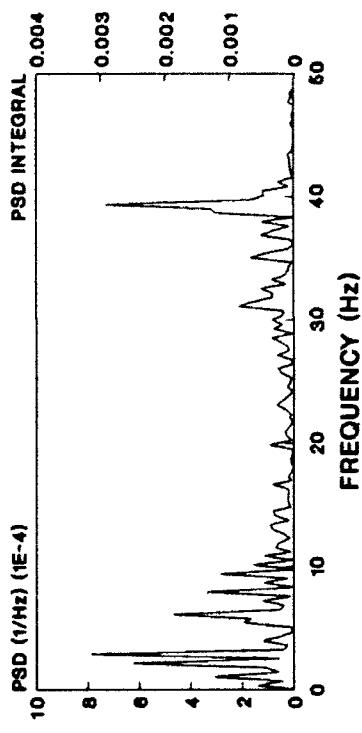
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



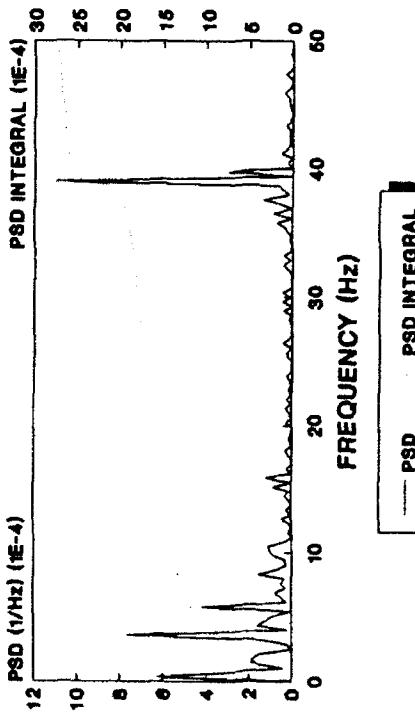
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



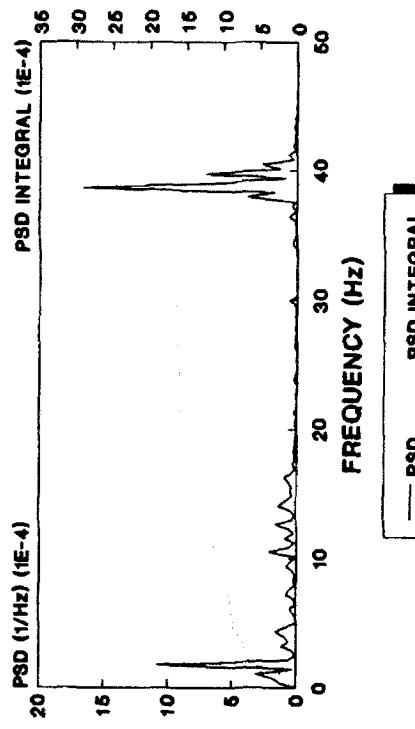
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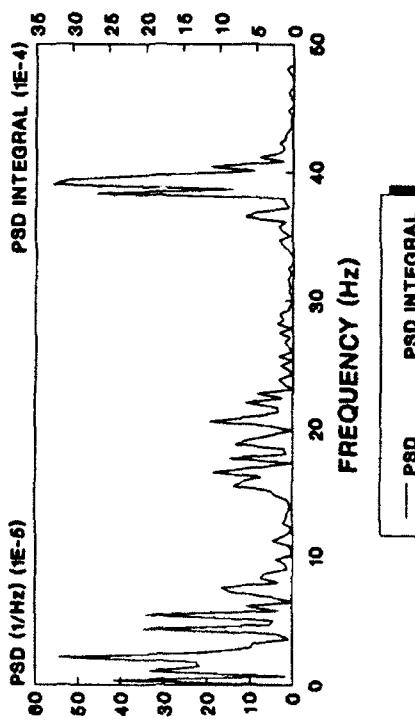
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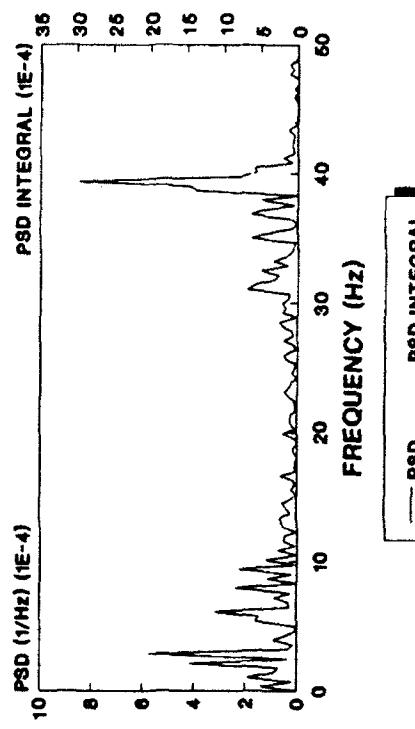
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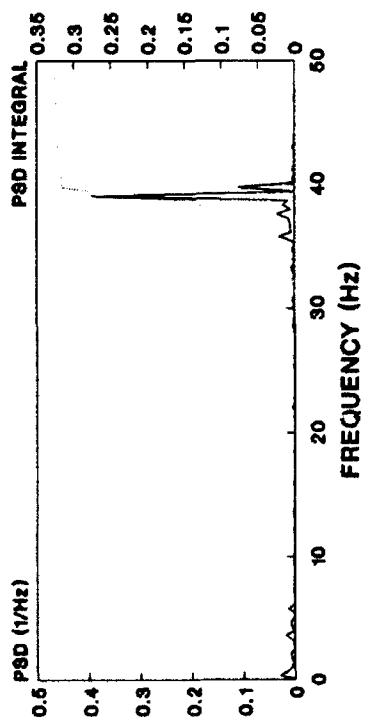
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL

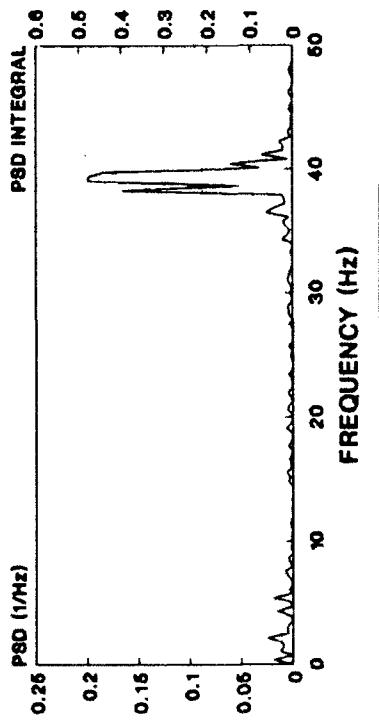


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



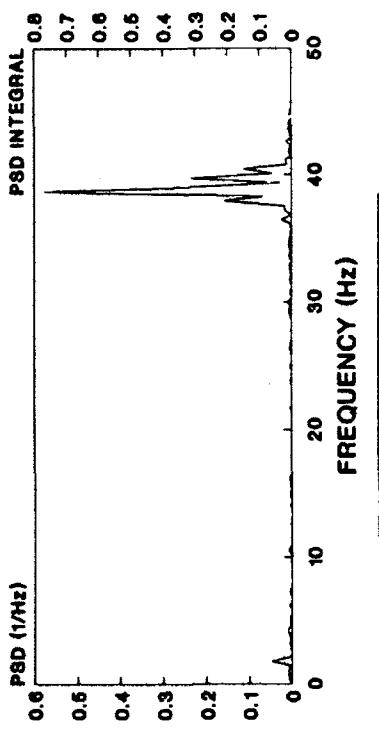
CUBE - HT 0.6 - THETA 30 - AZ 045

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



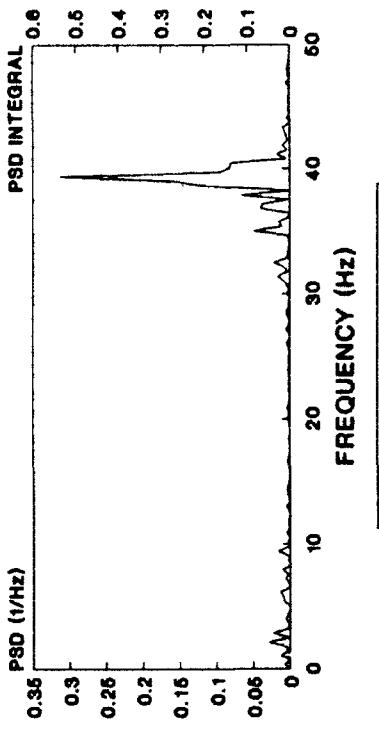
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MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



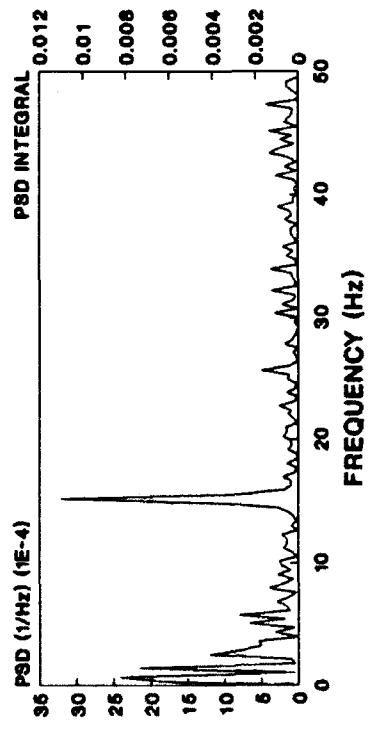
CUBE - HT 0.5 - THETA 30 - AZ 045

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

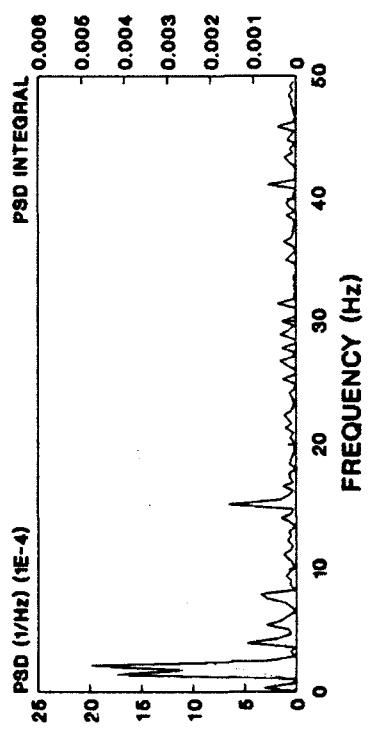


CUBE - HT 0.6 - THETA 30 - AZ 045

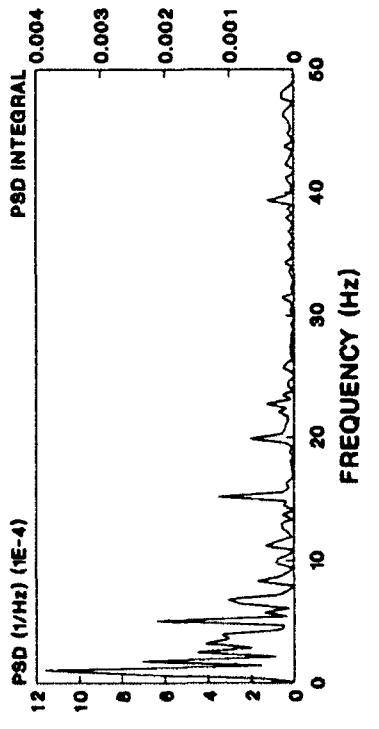
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



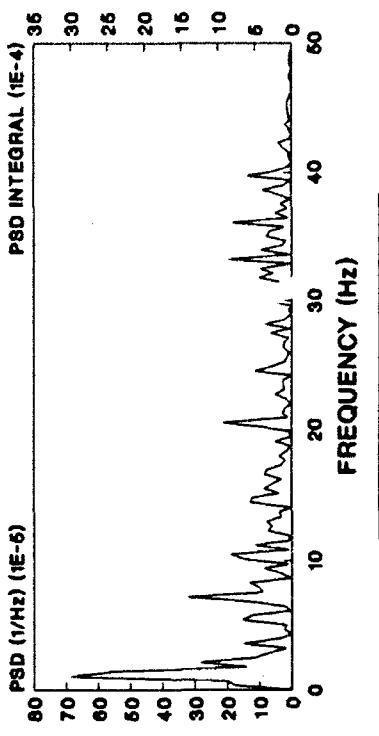
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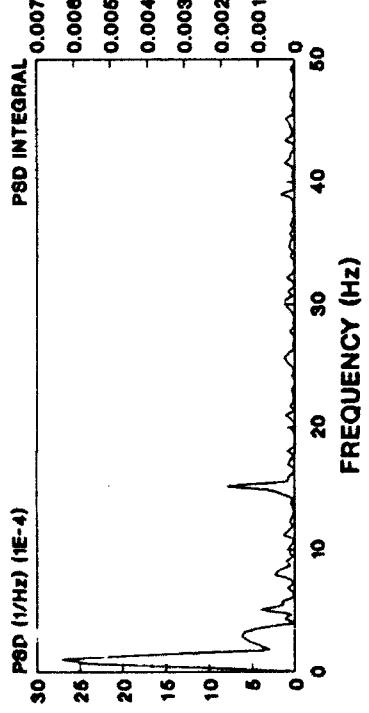
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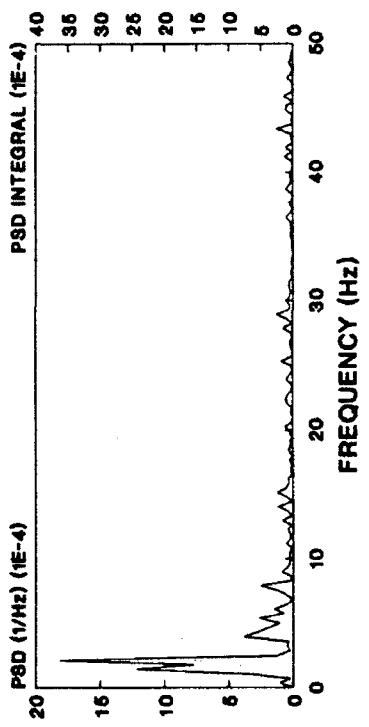
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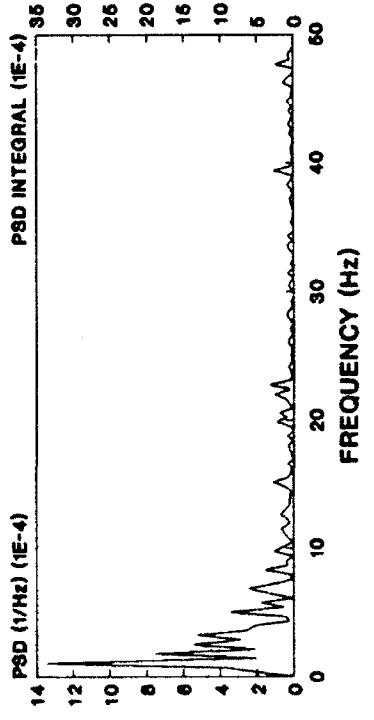
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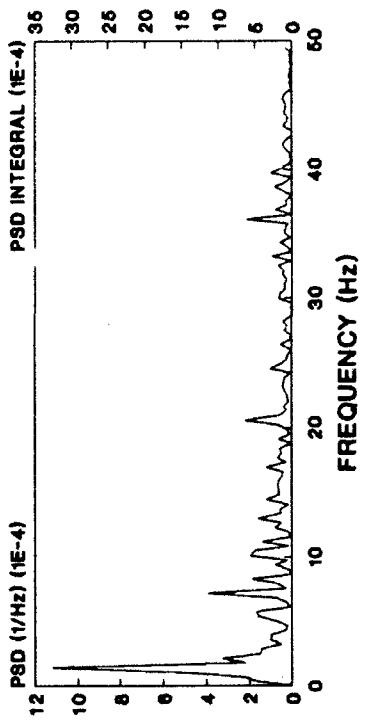
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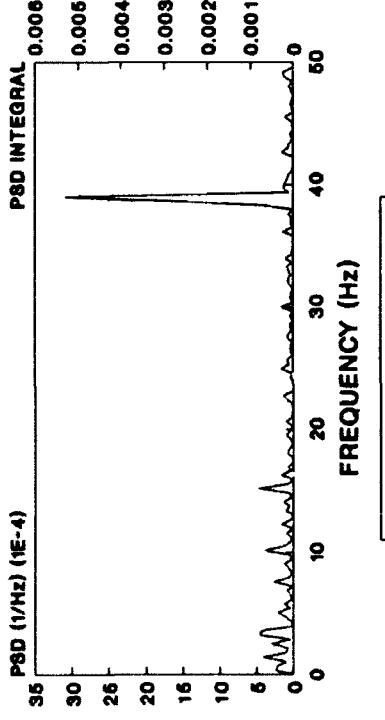
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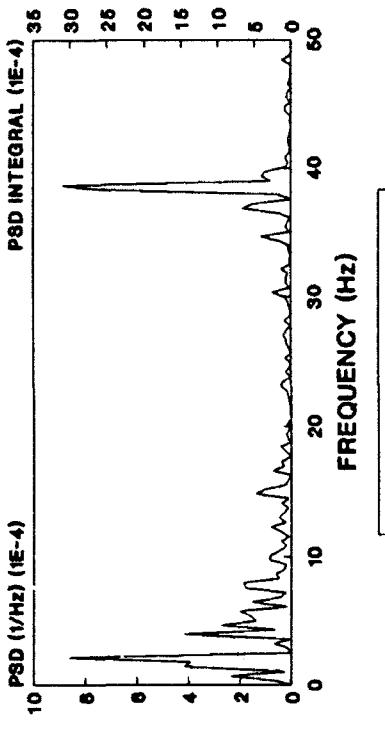
MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL



FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



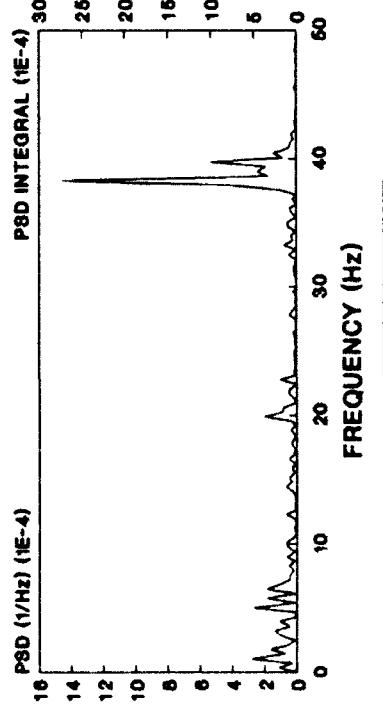
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



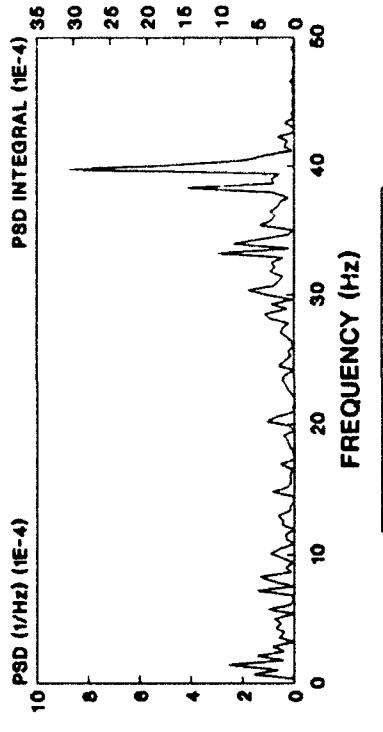
CUBE - HT 8.6 - THETA 30 - AZ 060

CUBE - HT 8.6 - THETA 30 - AZ 060

FORCE COEFF - LATERAL 120 FT/SEC NOMINAL

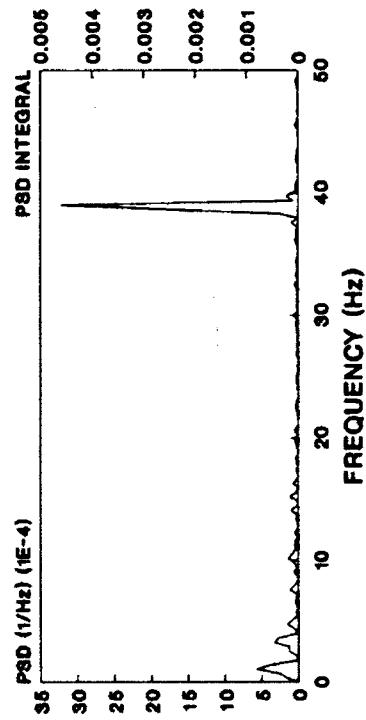


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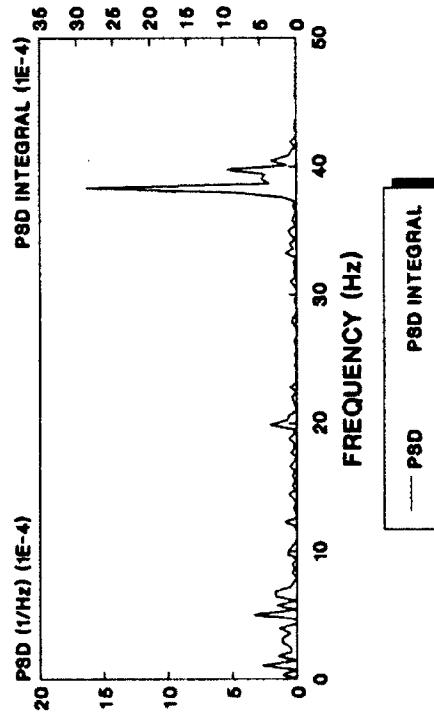
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MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



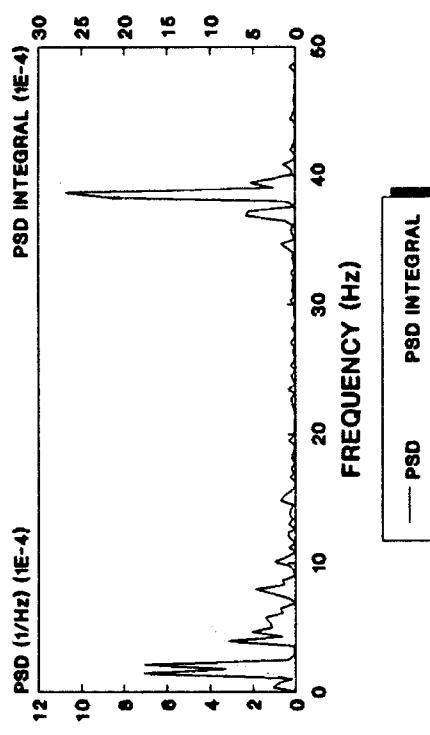
CUBE - HT 0.6 - THETA 30 - AZ 060

MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



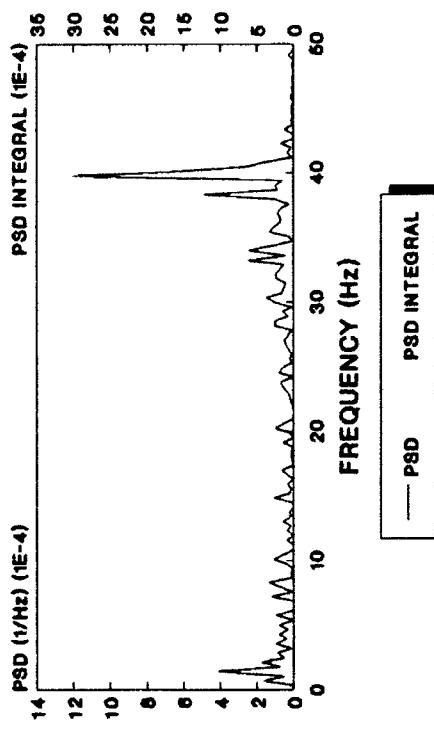
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MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



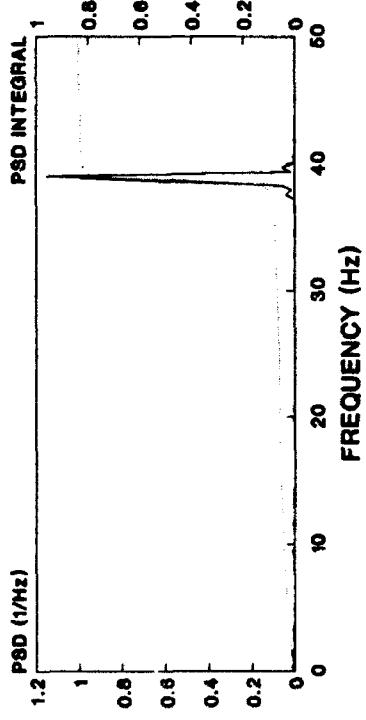
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MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



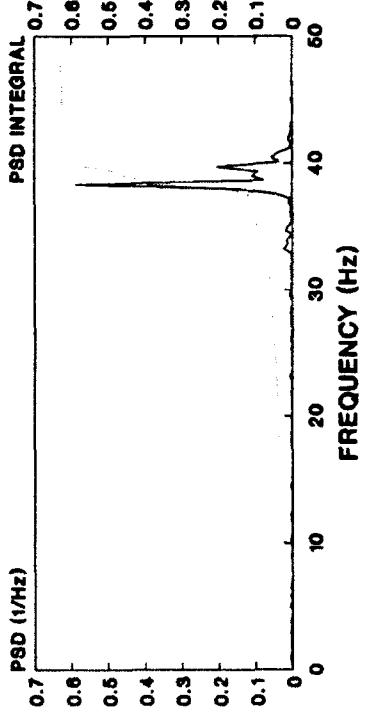
CUBE - HT 0.6 - THETA 30 - AZ 060

MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



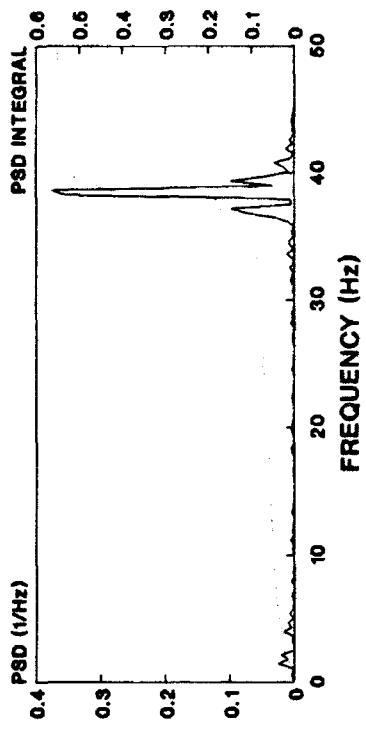
CUBE - HT 6.6 - THETA 30 - AZ 060

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



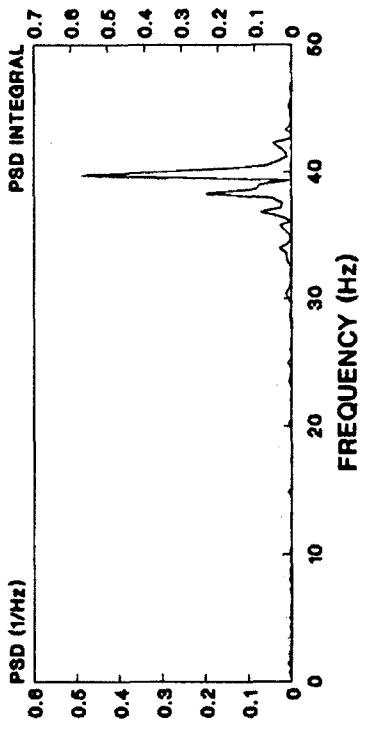
CUBE - HT 6.6 - THETA 30 - AZ 060

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



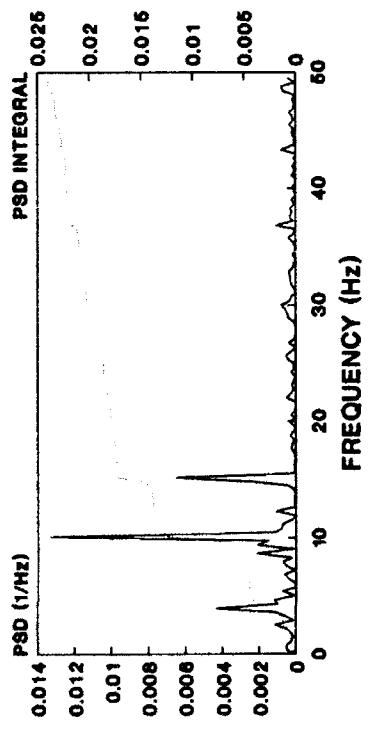
CUBE - HT 6.6 - THETA 30 - AZ 060

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



CUBE - HT 6.6 - THETA 30 - AZ 060

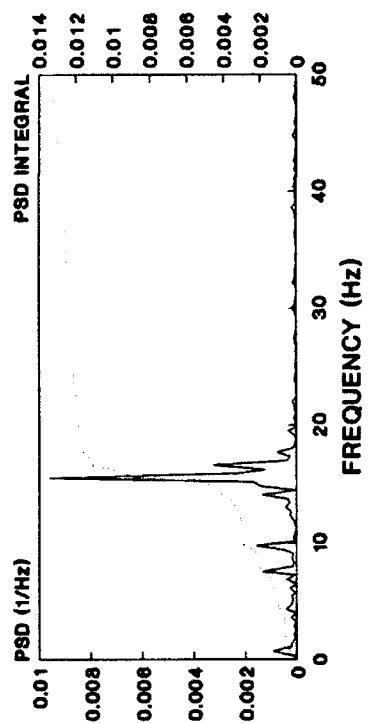
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



CUBE - HT 8.6 - THETA 30 - AZ 090

— PSD PSD INTEGRAL

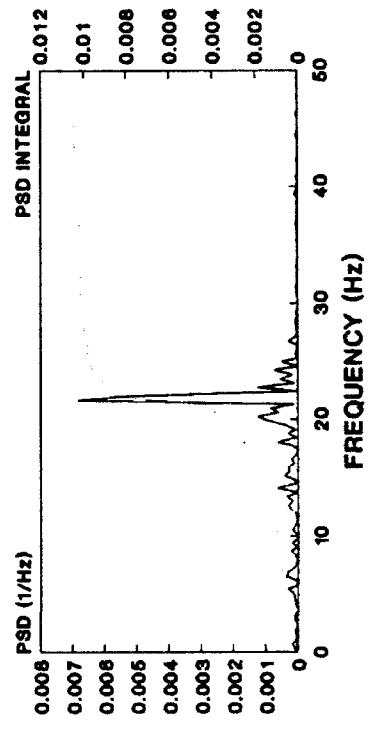
FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



CUBE - HT 8.6 - THETA 30 - AZ 090

— PSD PSD INTEGRAL

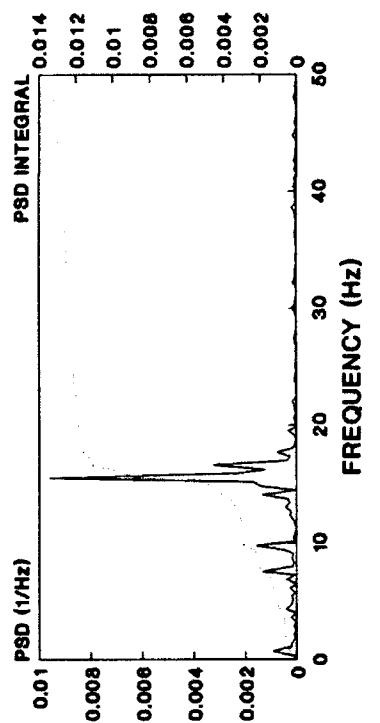
FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



CUBE - HT 8.6 - THETA 30 - AZ 090

— PSD PSD INTEGRAL

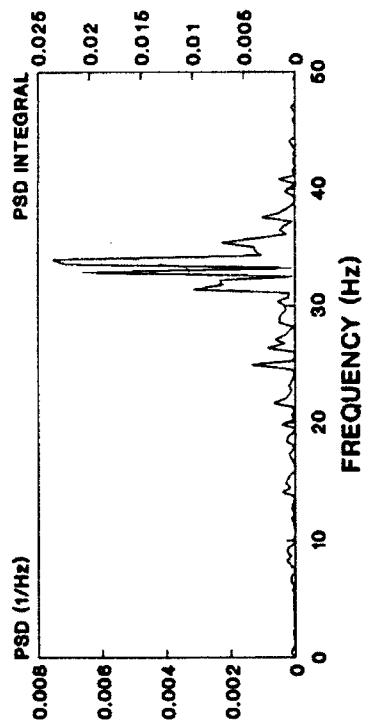
FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



CUBE - HT 8.6 - THETA 30 - AZ 090

— PSD PSD INTEGRAL

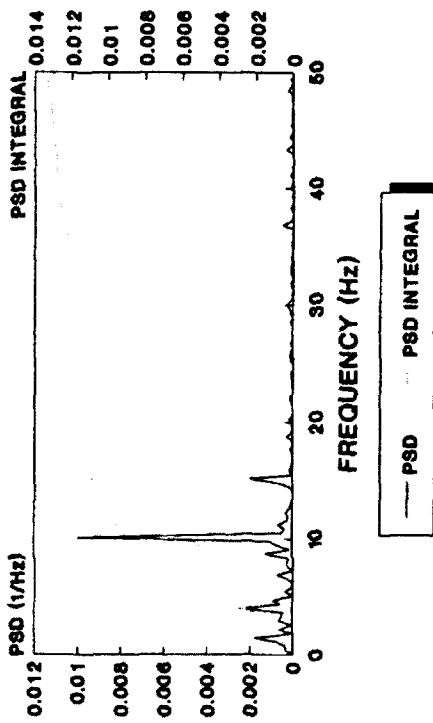
FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



CUBE - HT 8.6 - THETA 30 - AZ 090

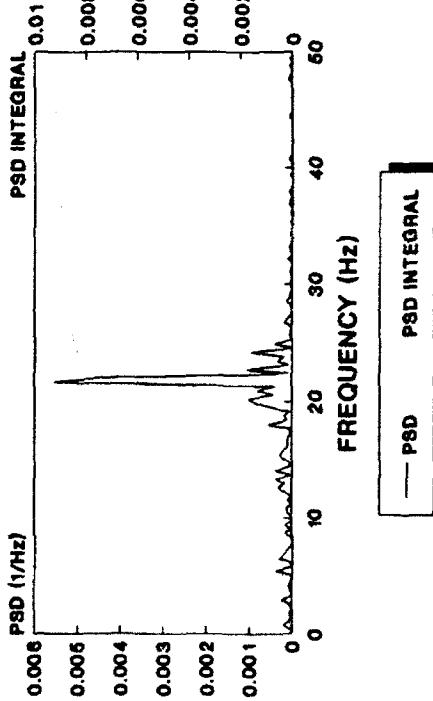
— PSD PSD INTEGRAL

MOMENT COEFF - NORMAL 60 FT/SEC NOMINAL



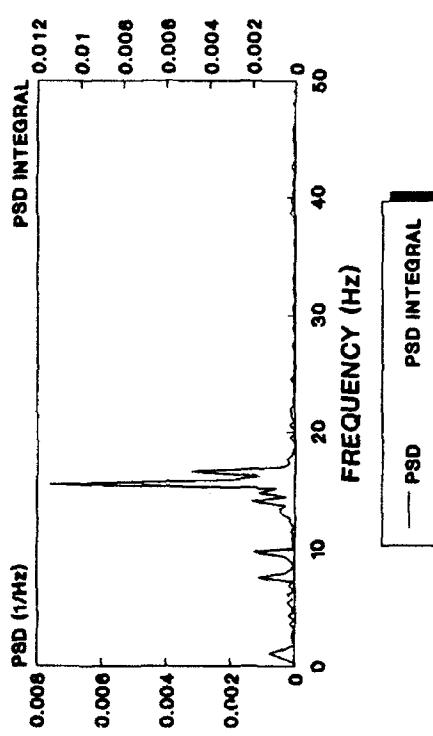
CUBE - HT 8.8 - THETA 30 - AZ 090

MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



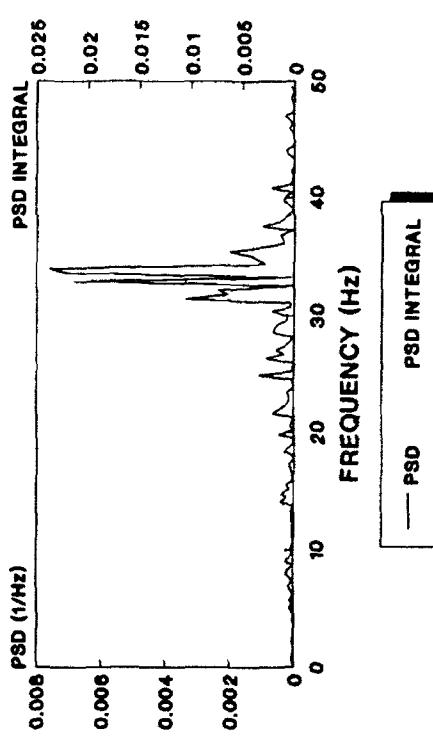
CUBE - HT 8.8 - THETA 30 - AZ 090

MOMENT COEFF - NORMAL 90 FT/SEC NOMINAL



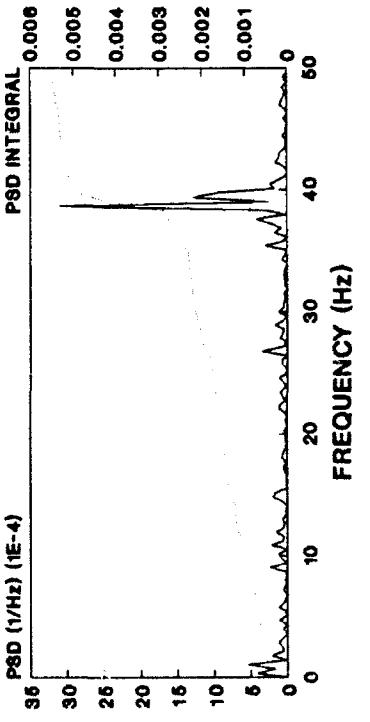
CUBE - HT 8.8 - THETA 30 - AZ 090

MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL

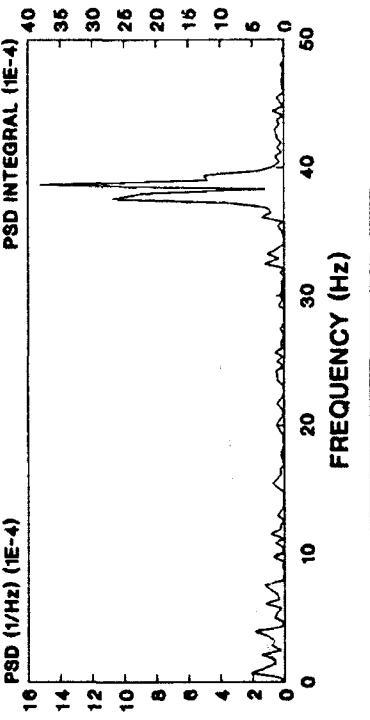


CUBE - HT 8.8 - THETA 30 - AZ 090

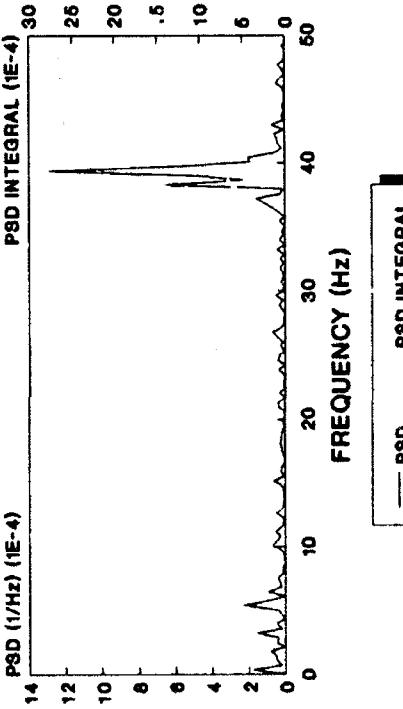
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



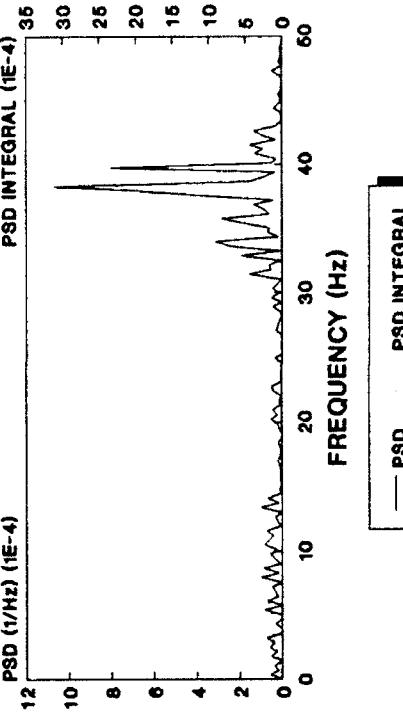
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



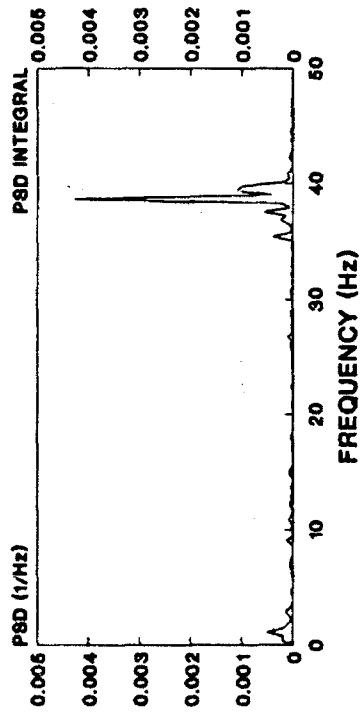
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



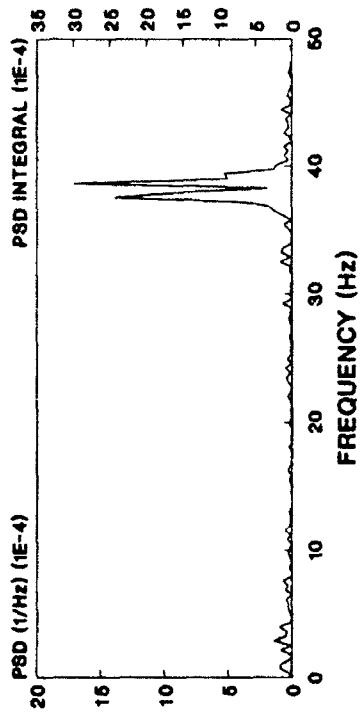
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



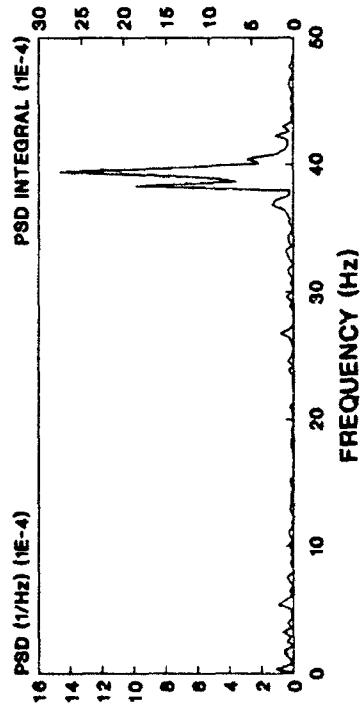
MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



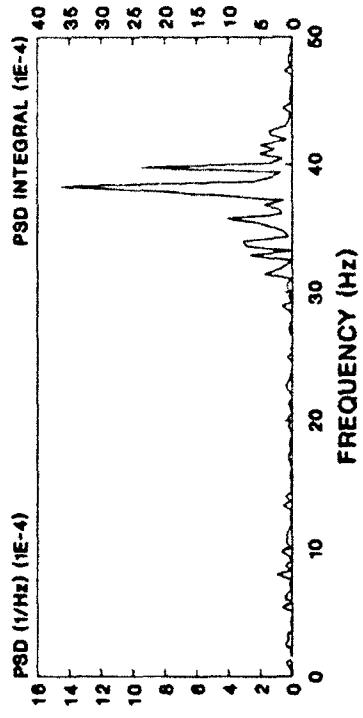
MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



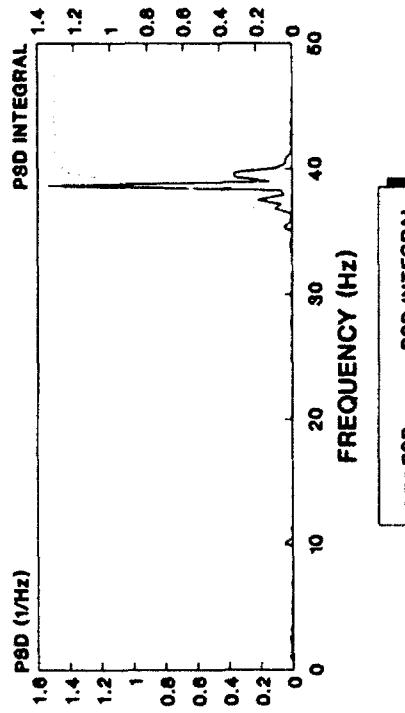
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL

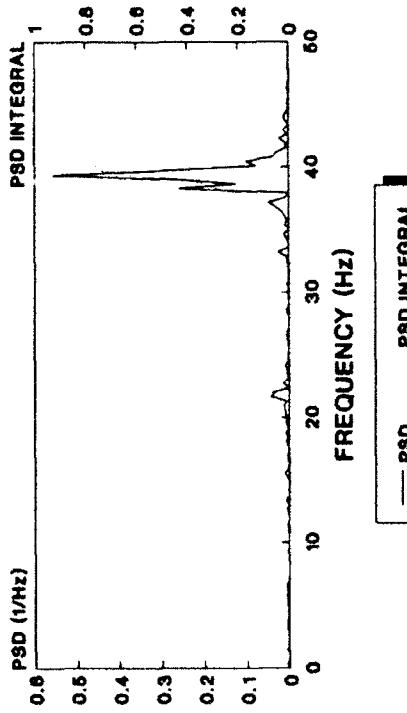


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



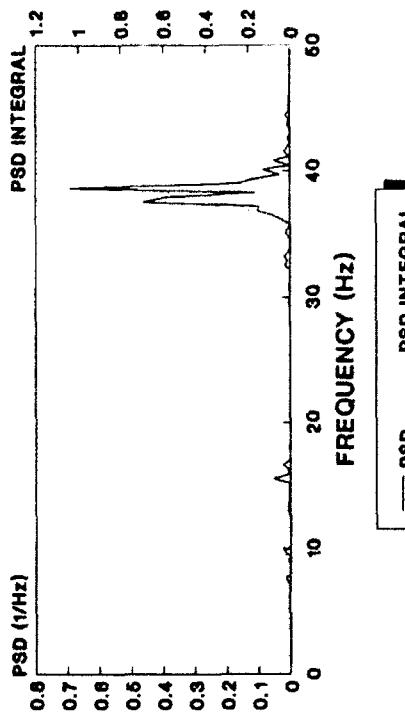
CUBE - HT 6.6 - THETA 30 - AZ 080

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



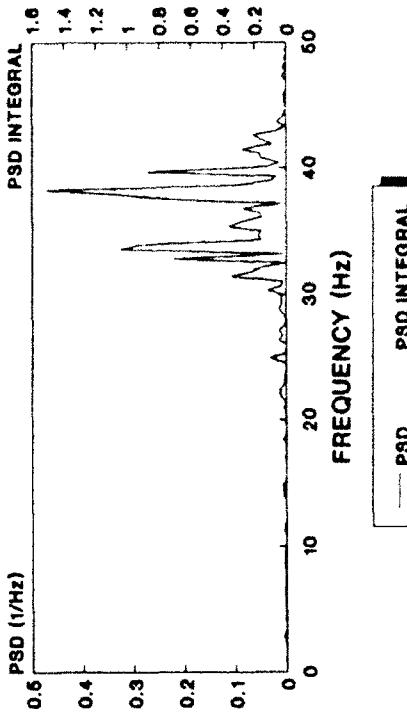
CUBE - HT 6.6 - THETA 30 - AZ 080

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



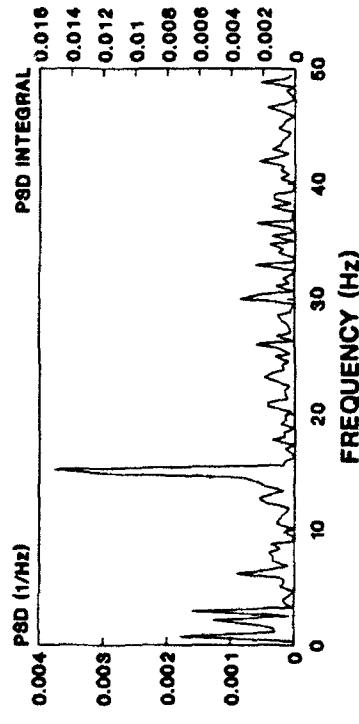
CUBE - HT 6.6 - THETA 30 - AZ 080

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

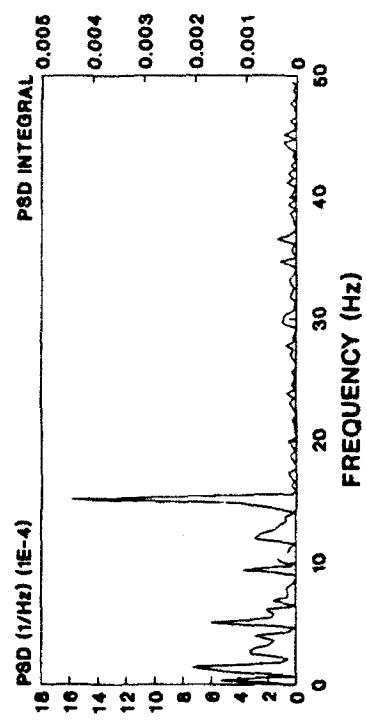


CUBE - HT 6.6 - THETA 30 - AZ 080

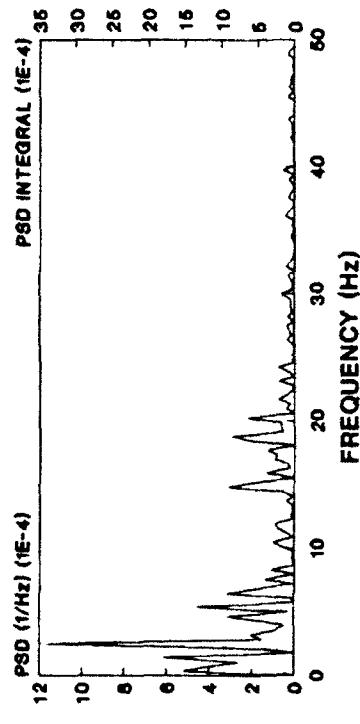
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



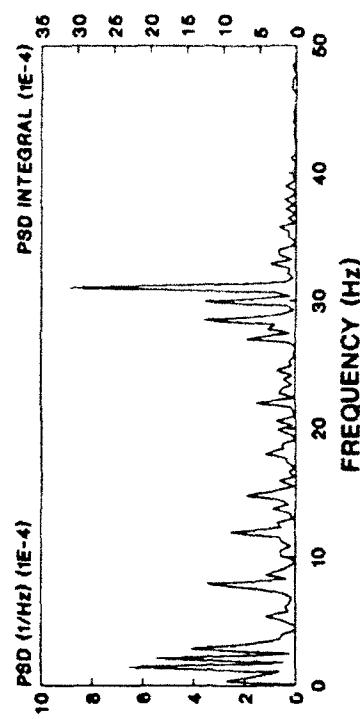
FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



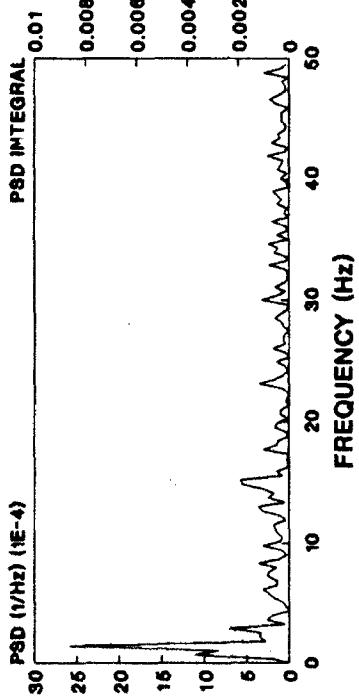
FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



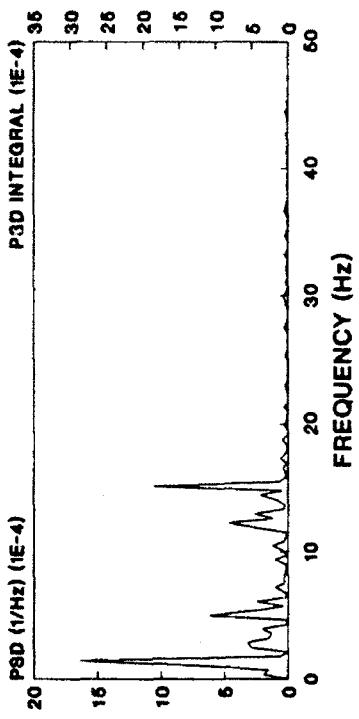
FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



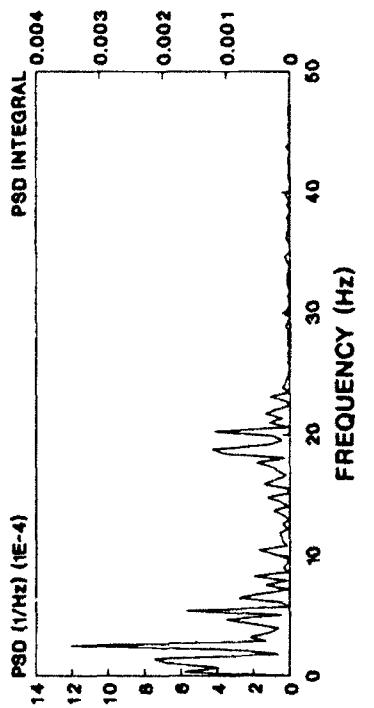
**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



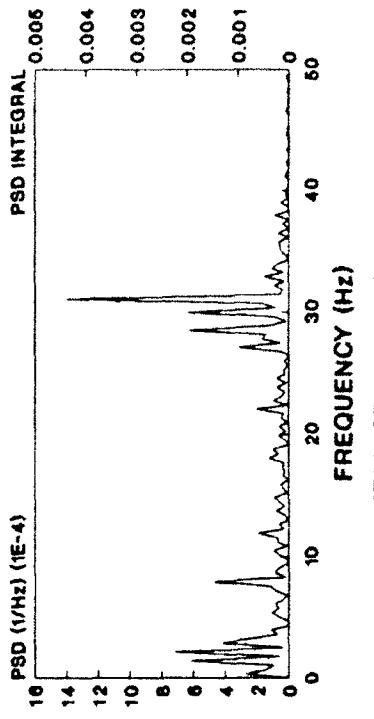
**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



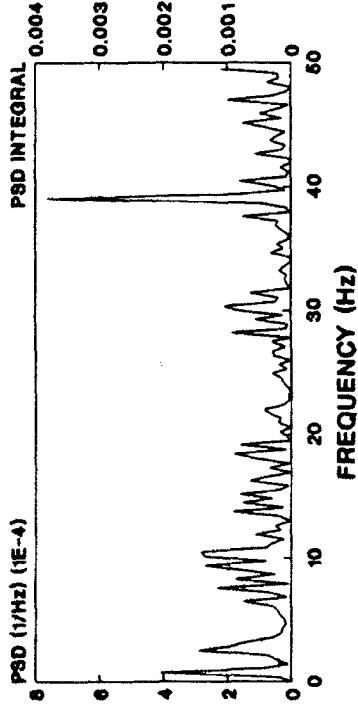
**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



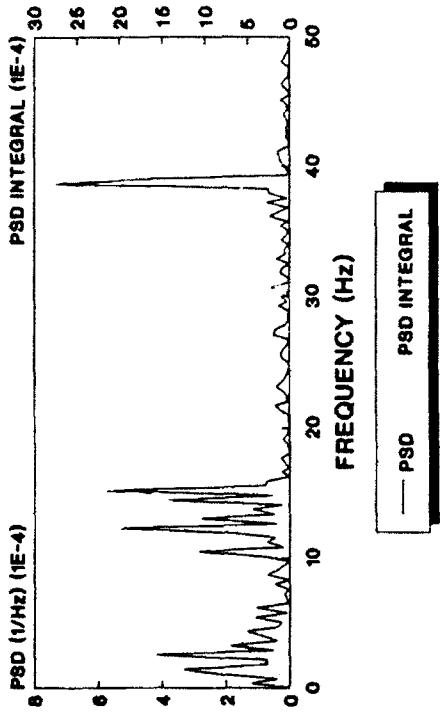
**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



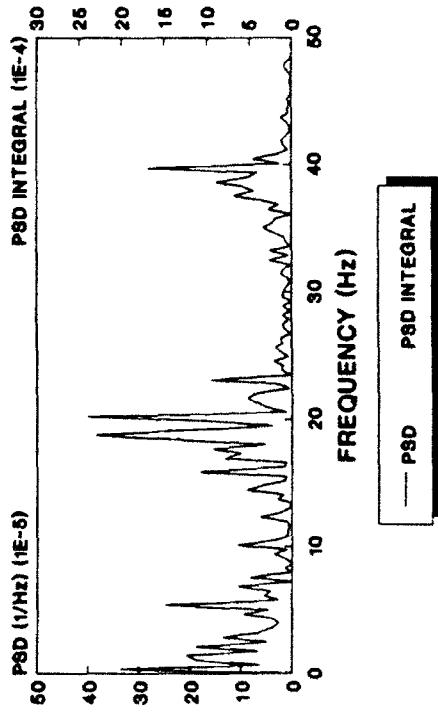
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



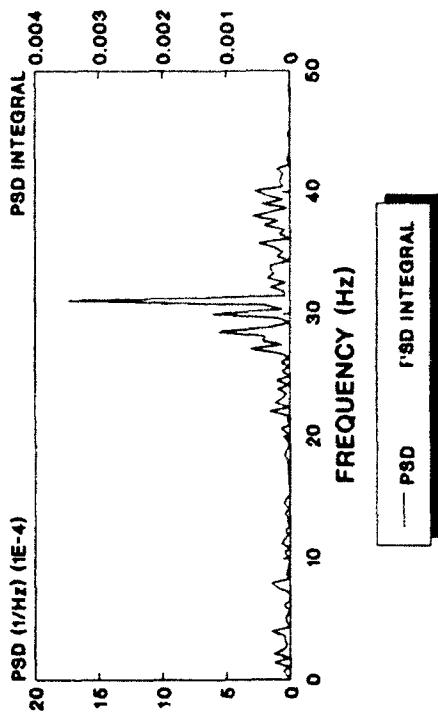
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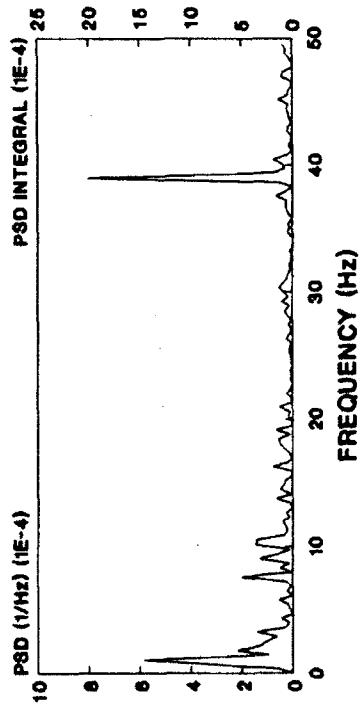
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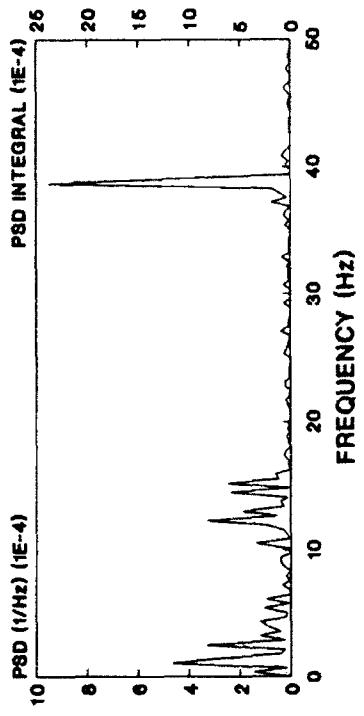
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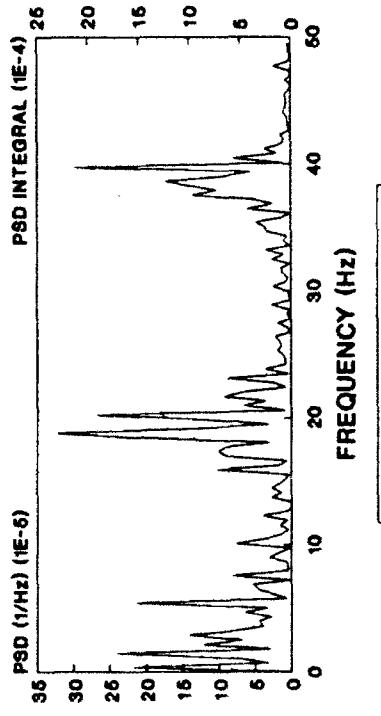
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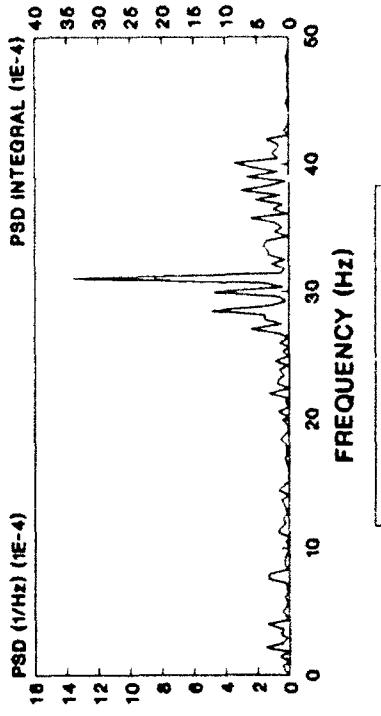
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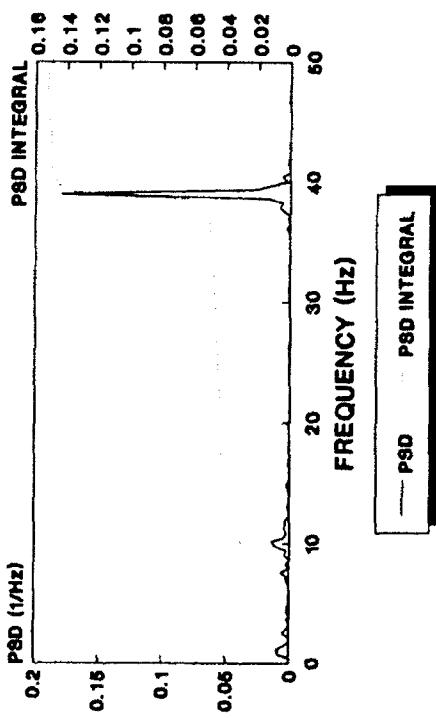
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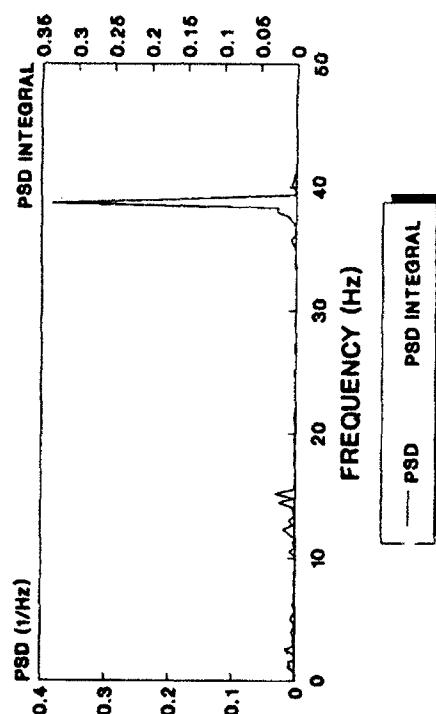
MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



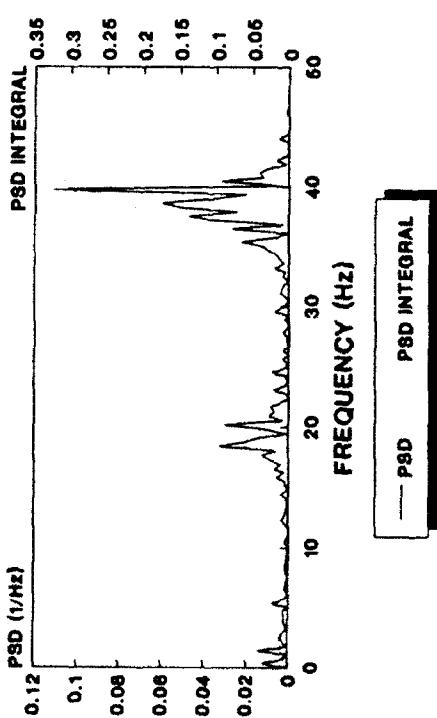
MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



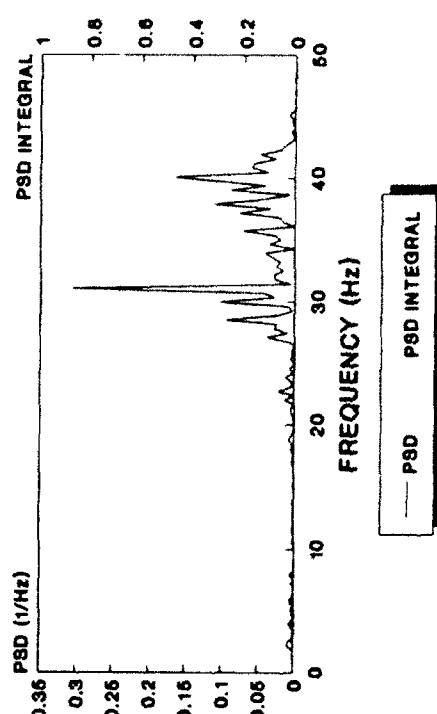
MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



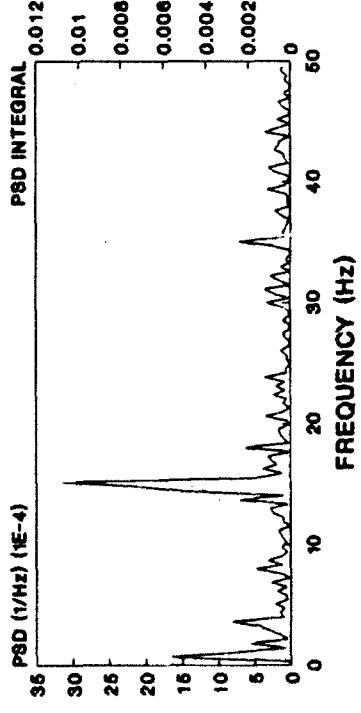
MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

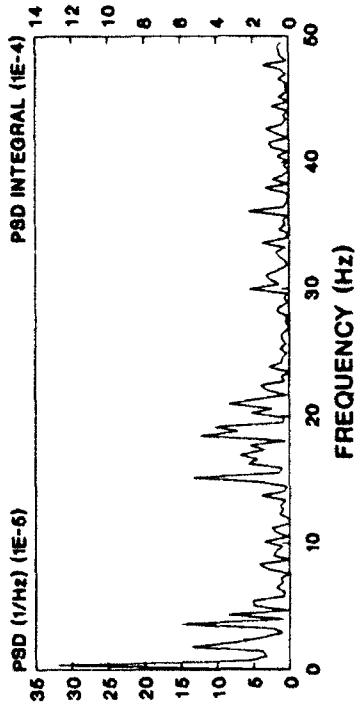


FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



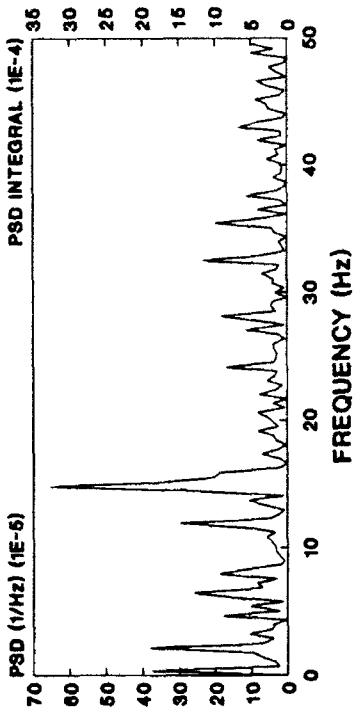
CUBE - HT 6.6 - THETA 30 - AZ 135

FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



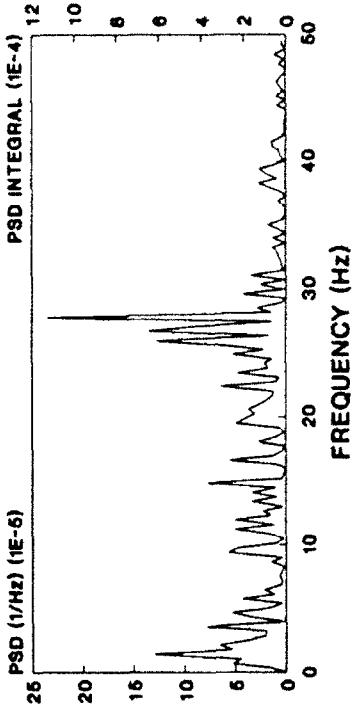
CUBE - HT 6.6 - THETA 30 - AZ 135

FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



CUBE - HT 6.6 - THETA 30 - AZ 135

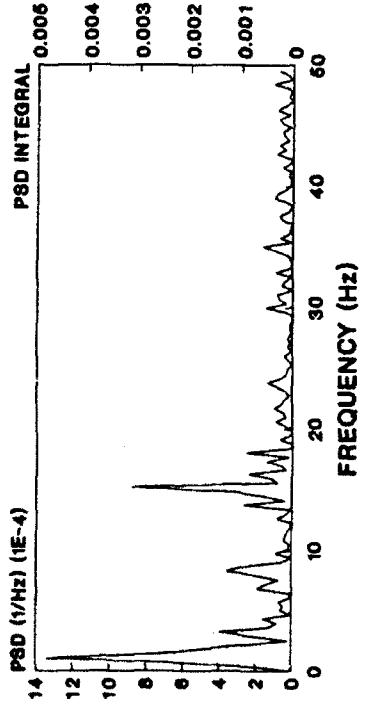
FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



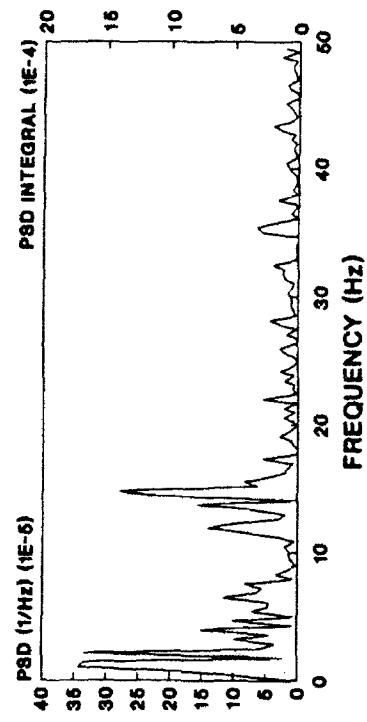
CUBE - HT 6.6 - THETA 30 - AZ 135

CUBE - HT 6.6 - THETA 30 - AZ 135

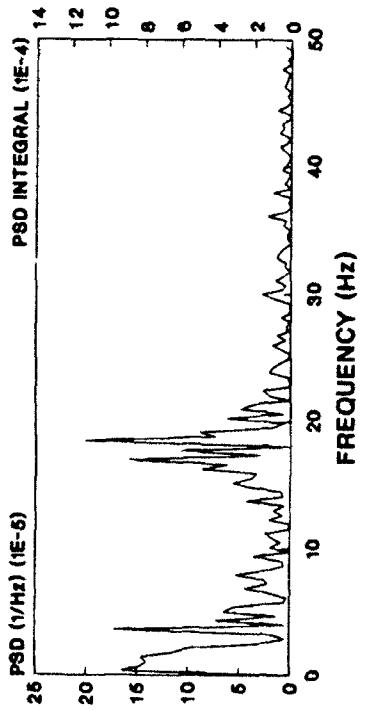
**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



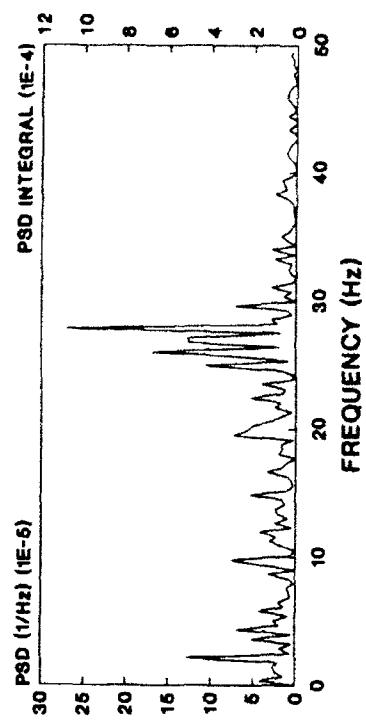
**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



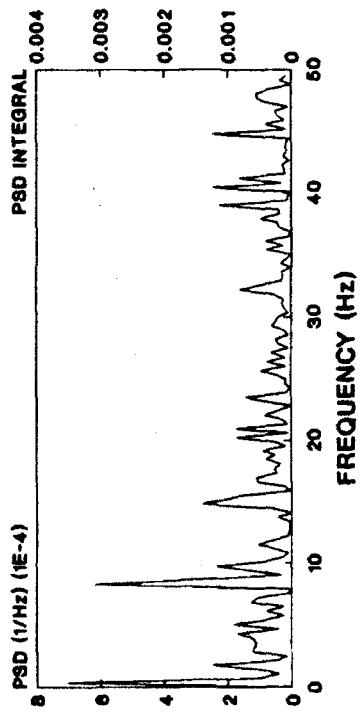
**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



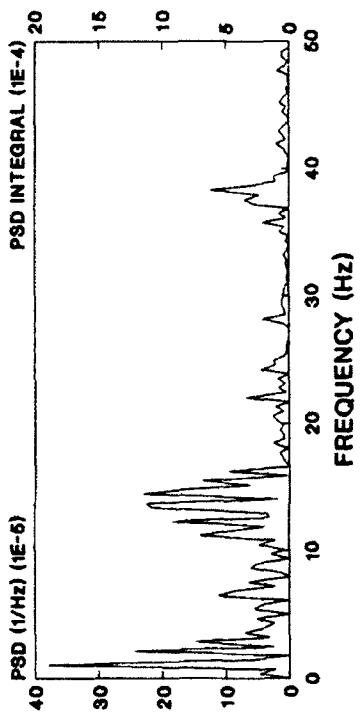
**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



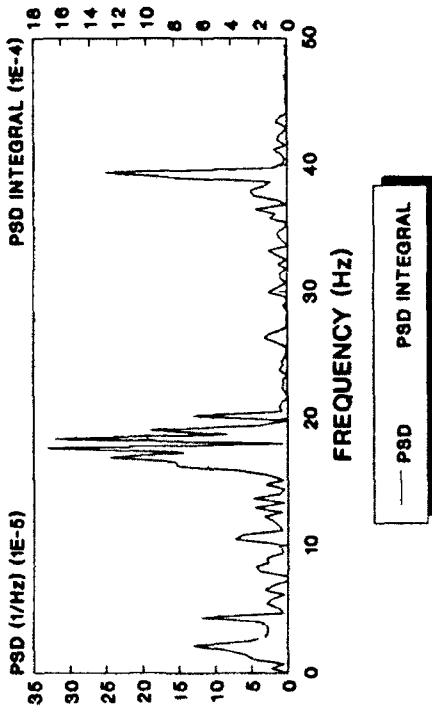
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



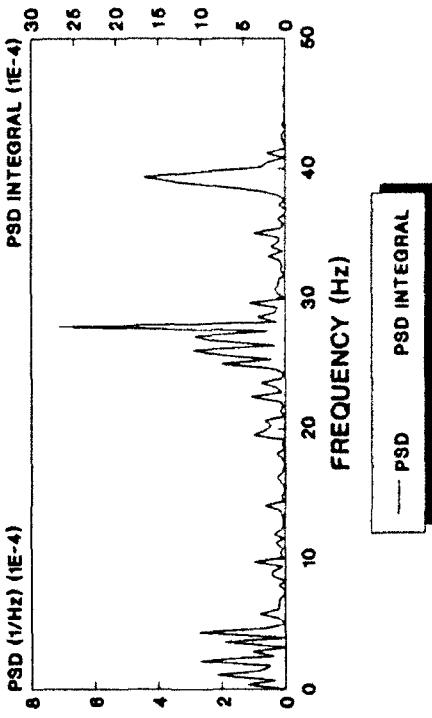
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



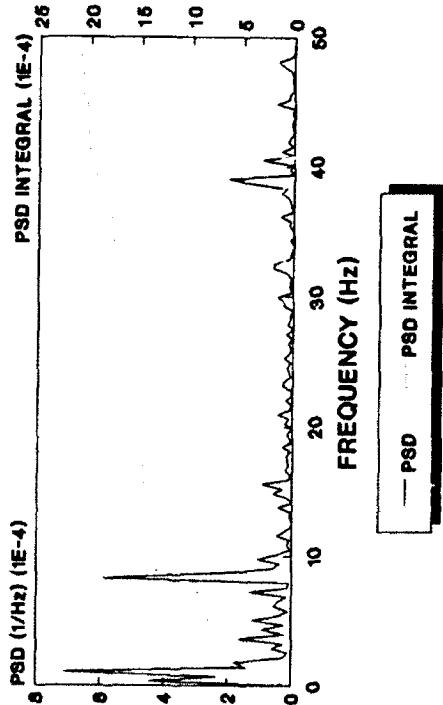
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



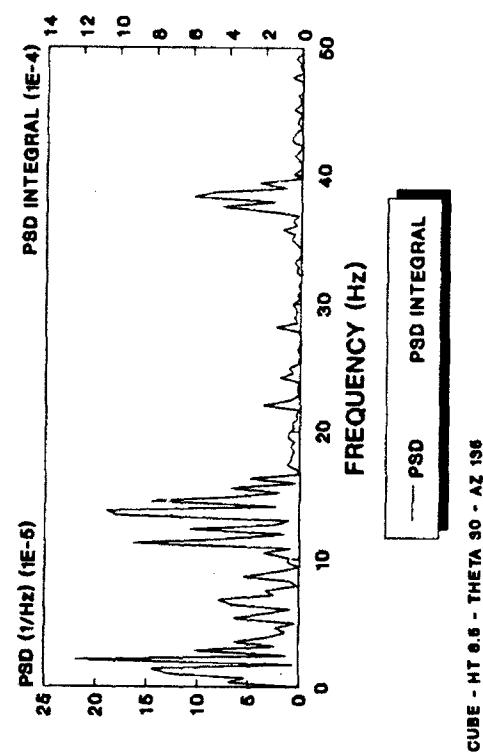
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



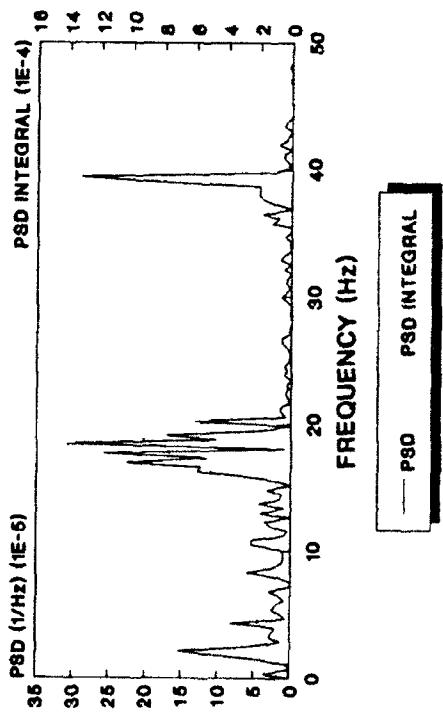
MOMENT COEFF - LATERAL
60 FT/SEC NOMINAL



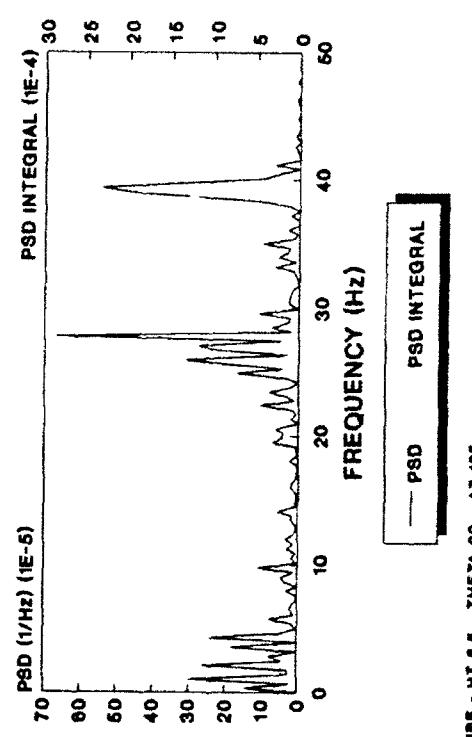
MOMENT COEFF - LATERAL
90 FT/SEC NOMINAL



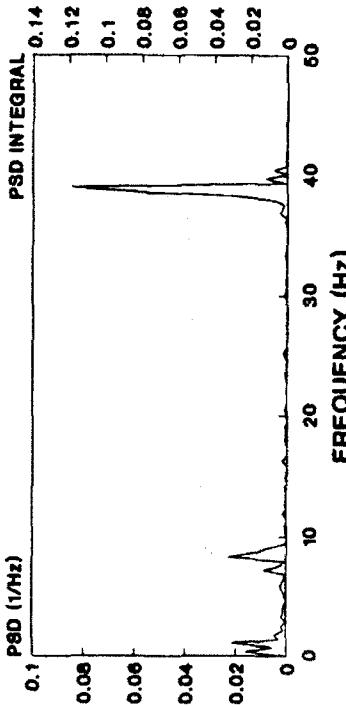
MOMENT COEFF - LATERAL
120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL
180 FT/SEC NOMINAL

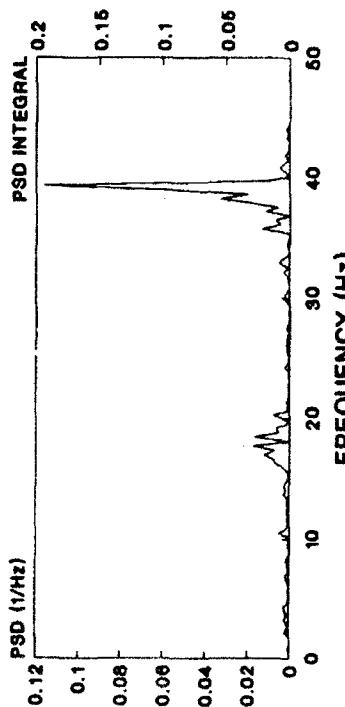


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



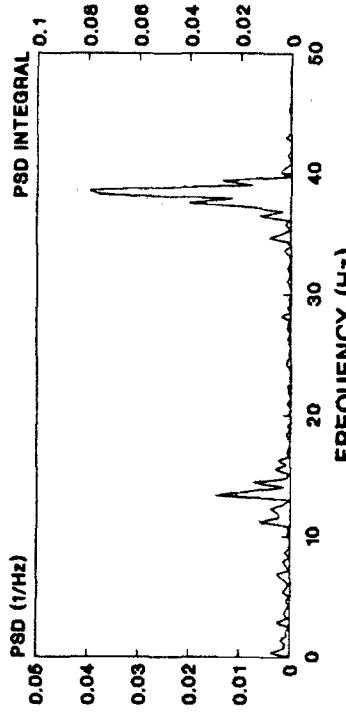
CUBE - HT 0.6 - THETA 30 - AZ 136

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



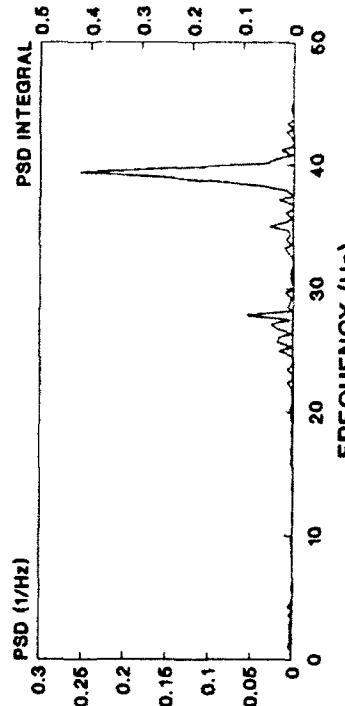
CUBE - HT 0.6 - THETA 30 - AZ 136

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



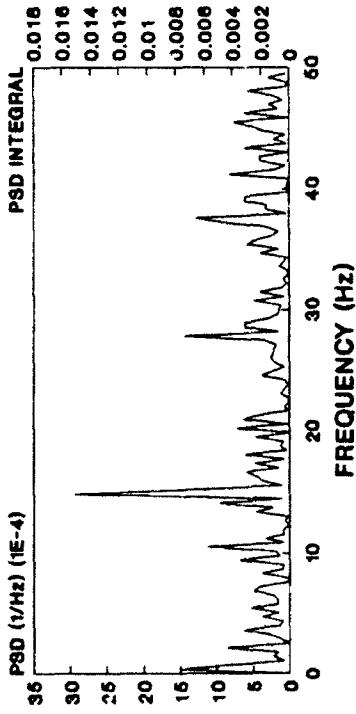
CUBE - HT 0.6 - THETA 30 - AZ 136

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



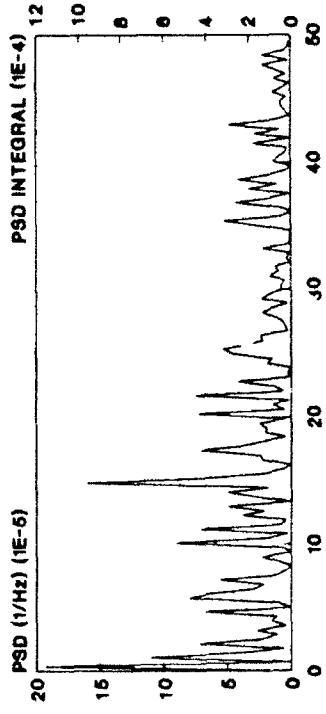
CUBE - HT 0.6 - THETA 30 - AZ 136

FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



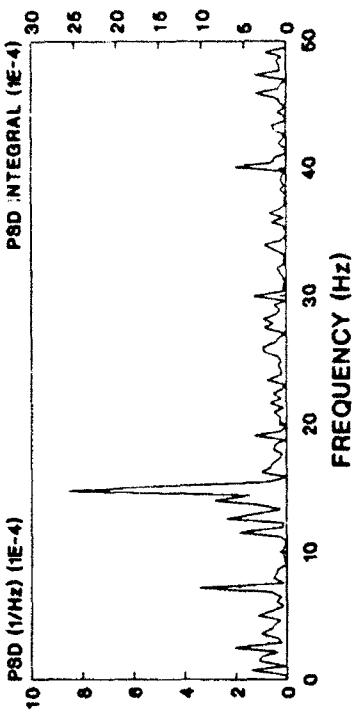
CUBE - HT 6.6 - THETA 30 - AZ 180

FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



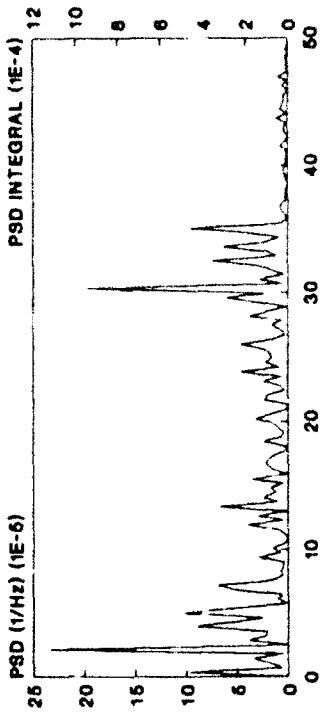
CUBE - HT 6.6 - THETA 30 - AZ 180

FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



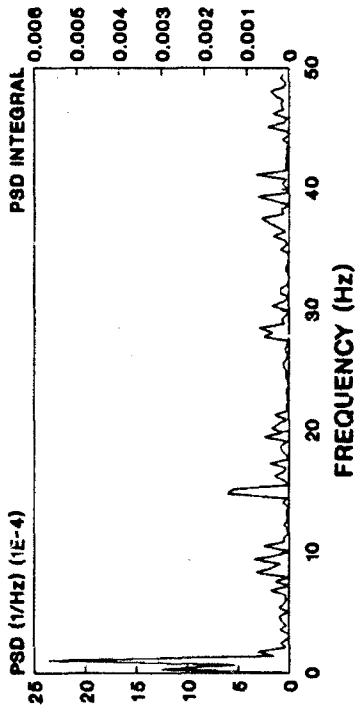
CUBE - HT 6.6 - THETA 30 - AZ 180

FORCE COEFF - NORMAL 180 FT/SEC NOMINAL

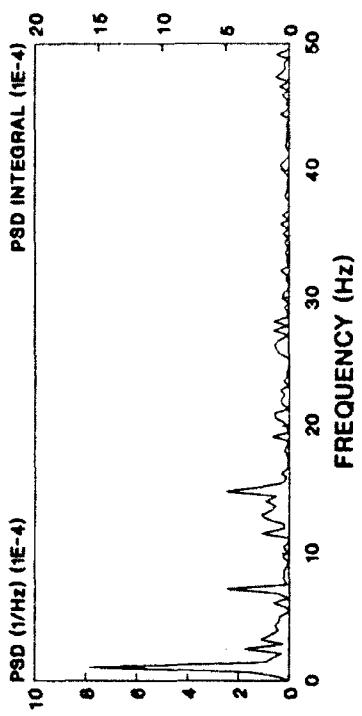


CUBE - HT 6.6 - THETA 30 - AZ 180

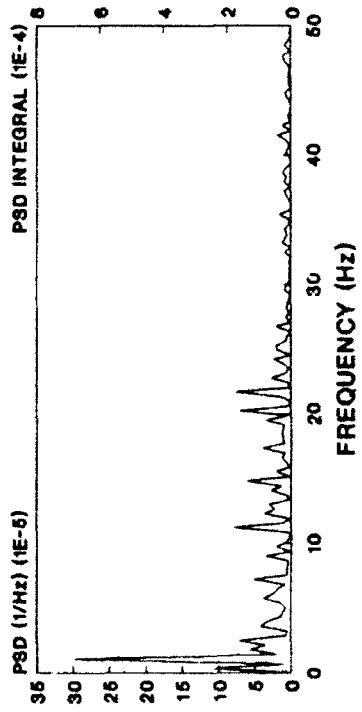
**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



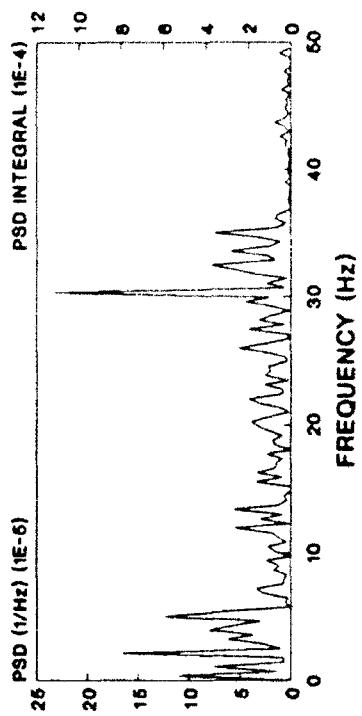
**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



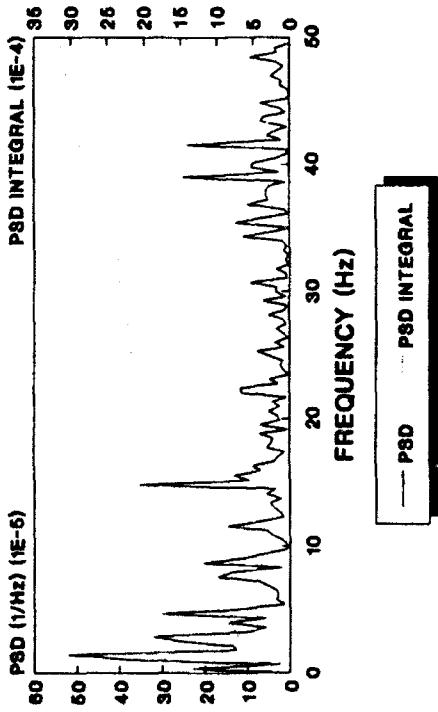
**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



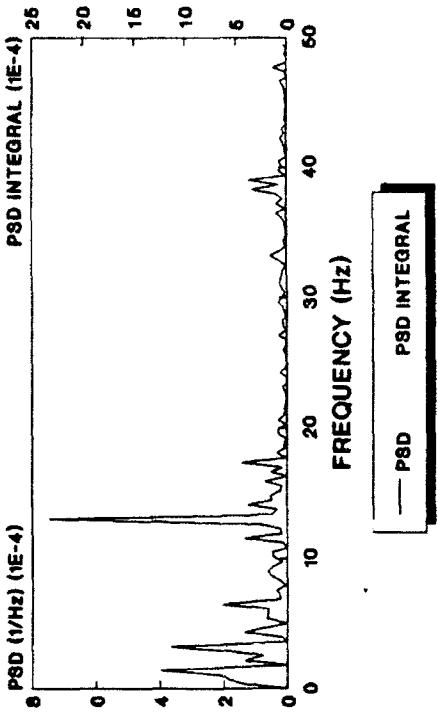
**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



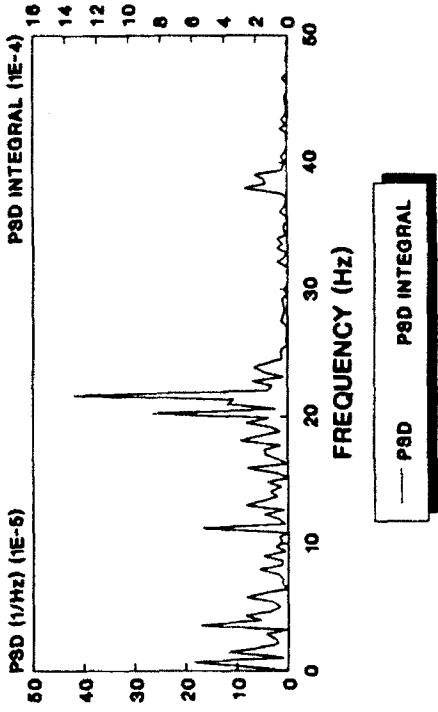
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



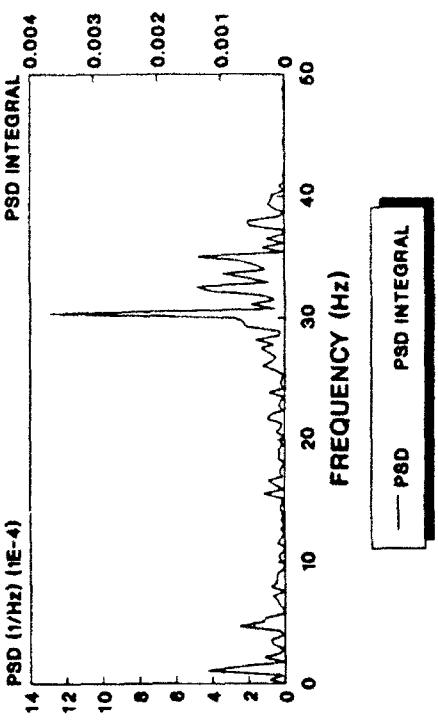
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



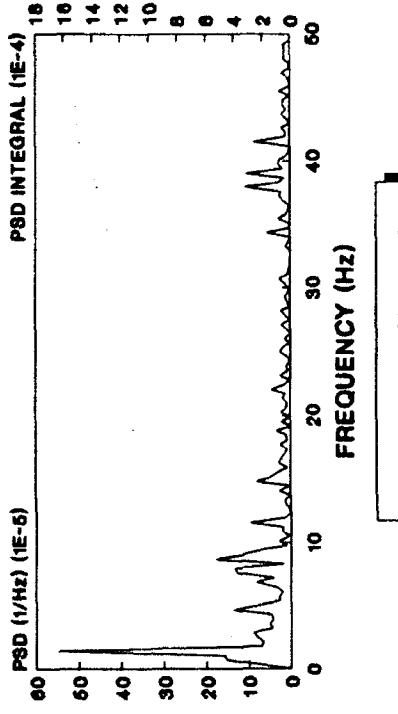
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



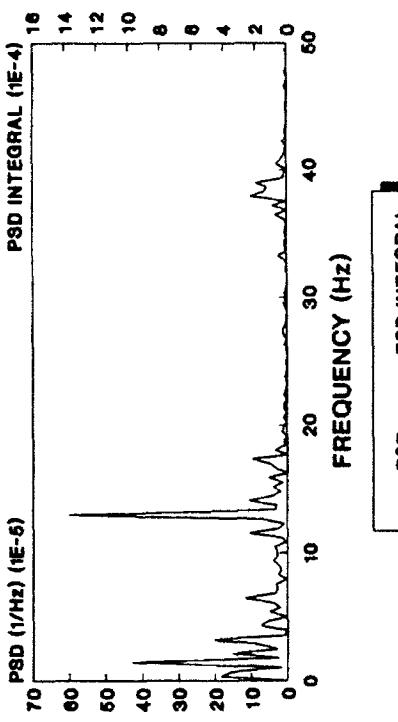
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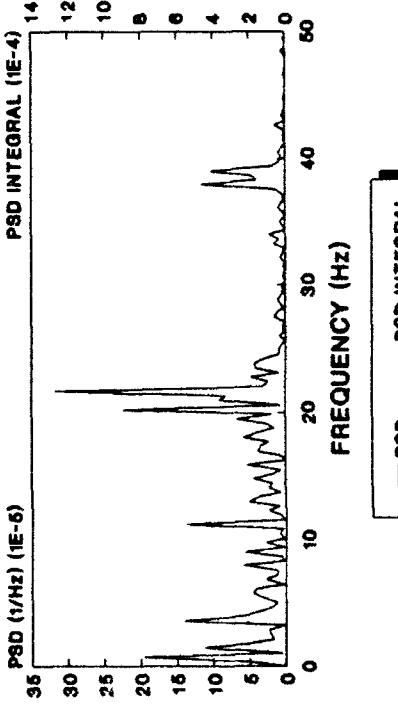
MOMENT COEFF - LATERAL
60 FT/SEC NOMINAL



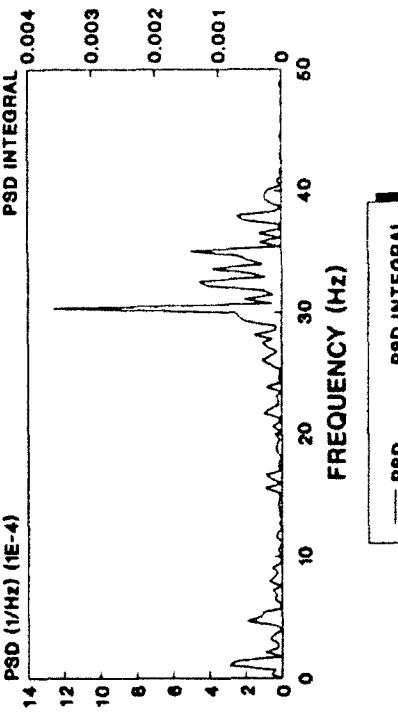
MOMENT COEFF - LATERAL
90 FT/SEC NOMINAL



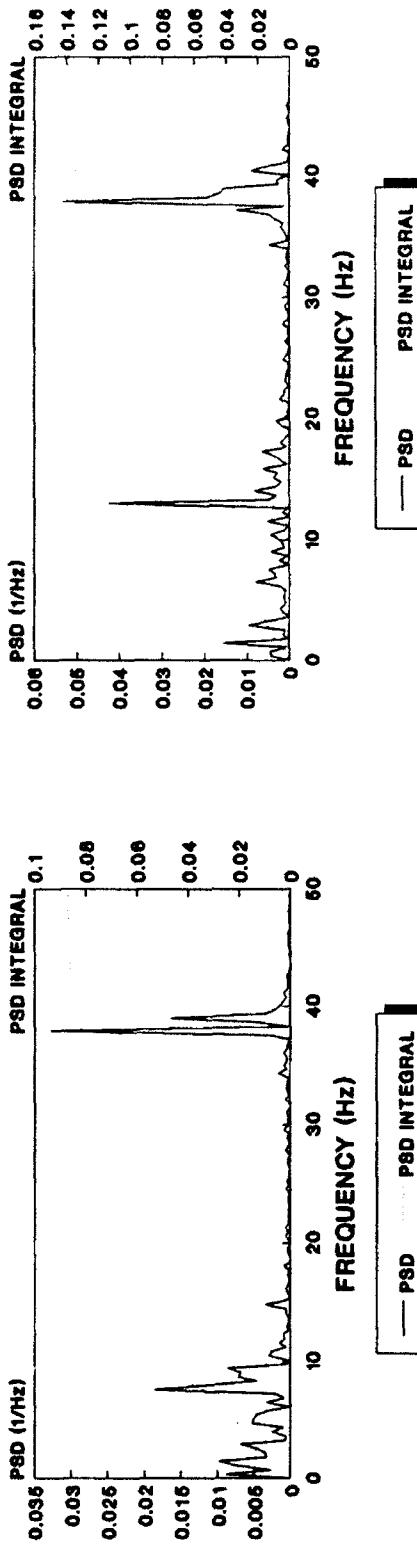
MOMENT COEFF - LATERAL
120 FT/SEC NOMINAL



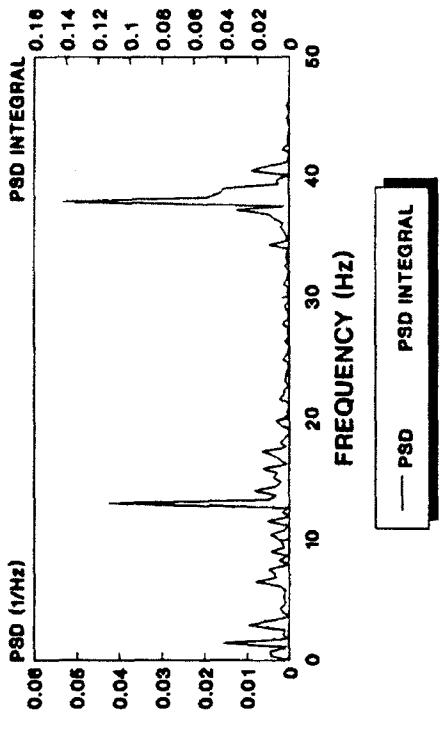
MOMENT COEFF - LATERAL
180 FT/SEC NOMINAL



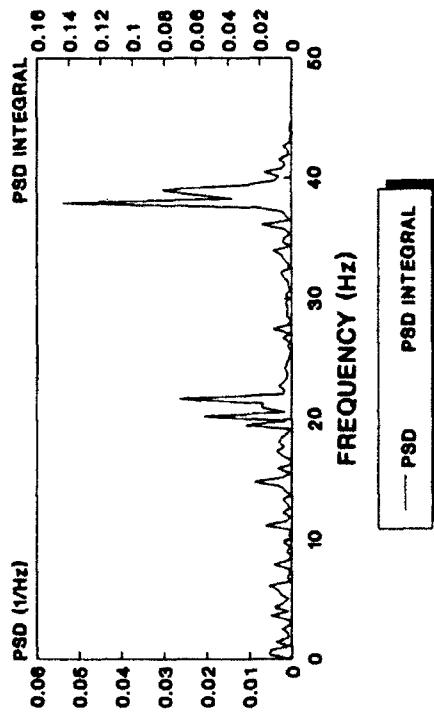
MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



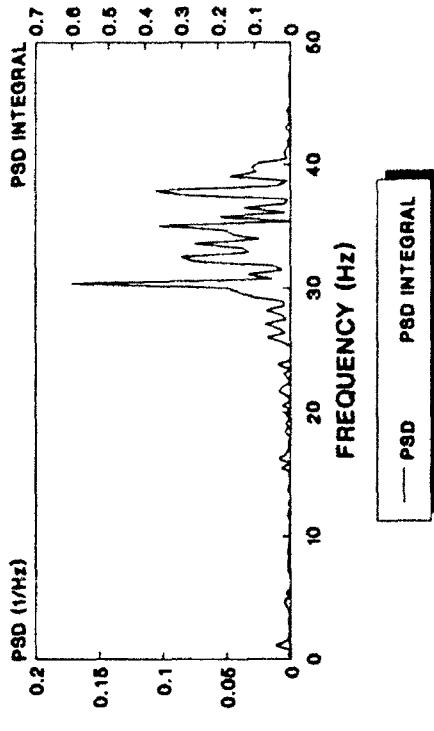
MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



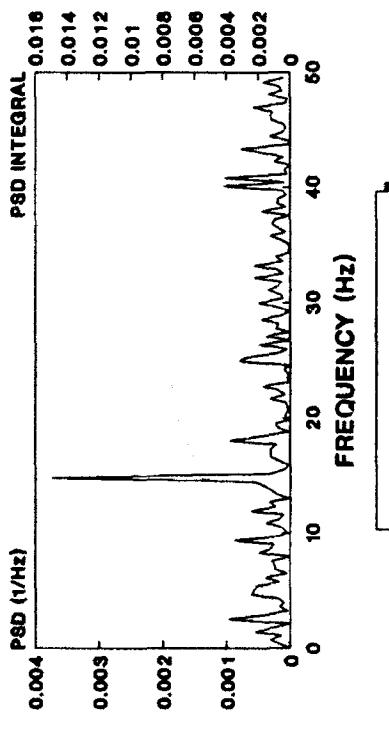
MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



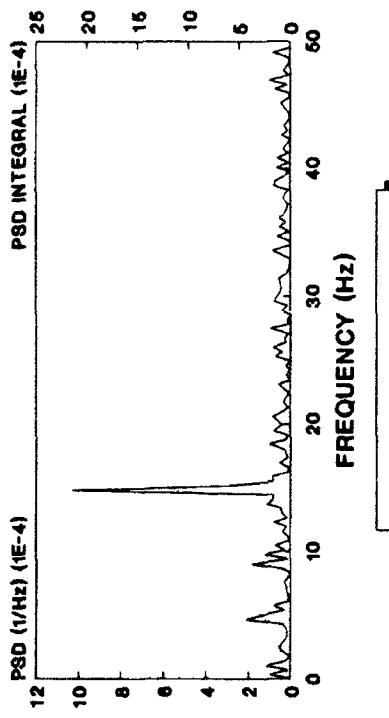
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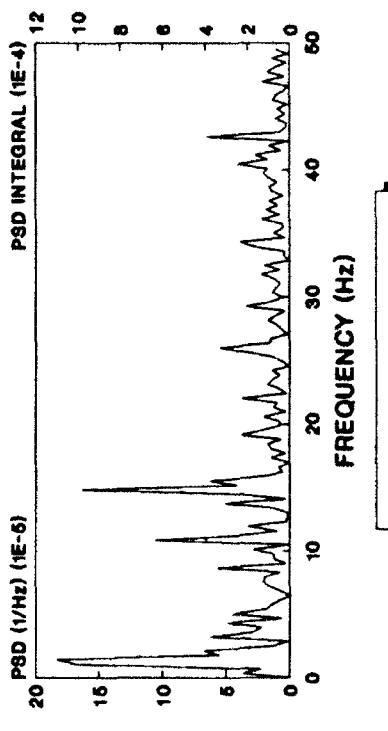
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



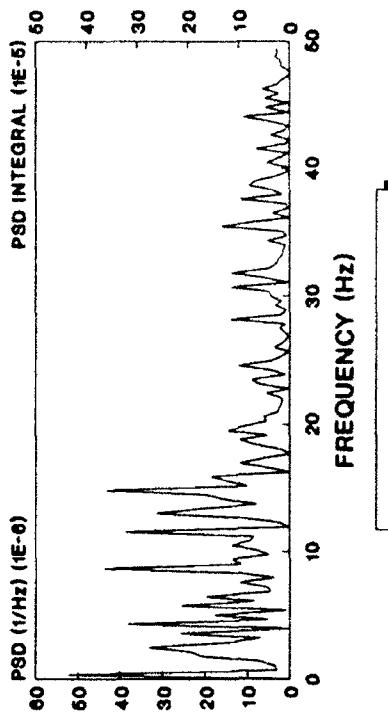
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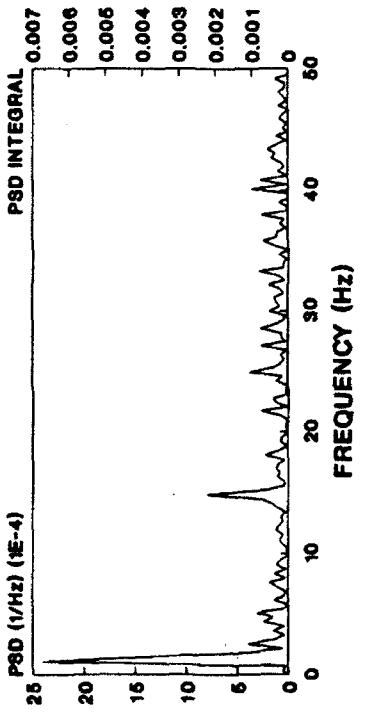
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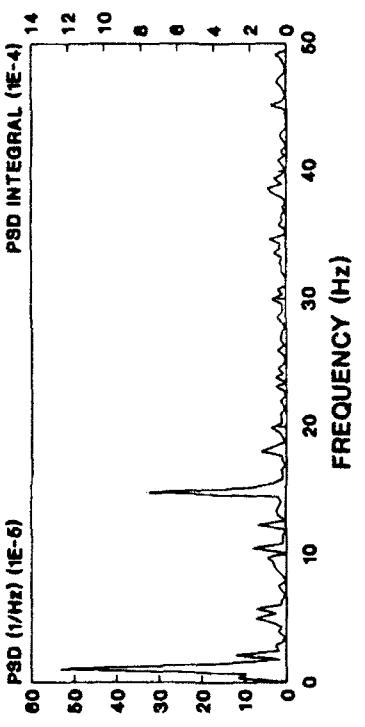
FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



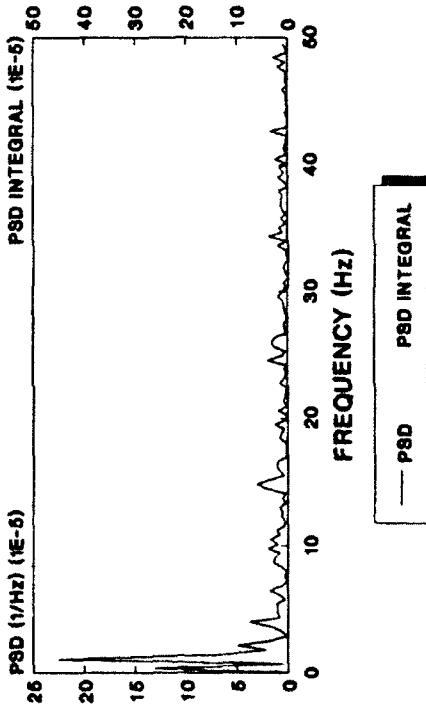
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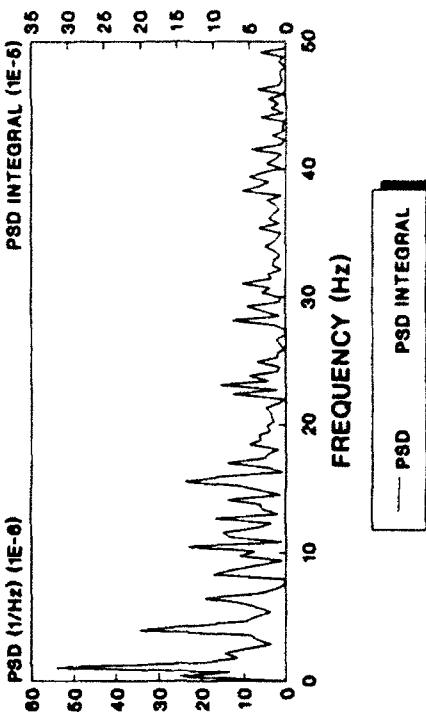
MOMENT COEFF - NORMAL 90 FT/SEC NOMINAL



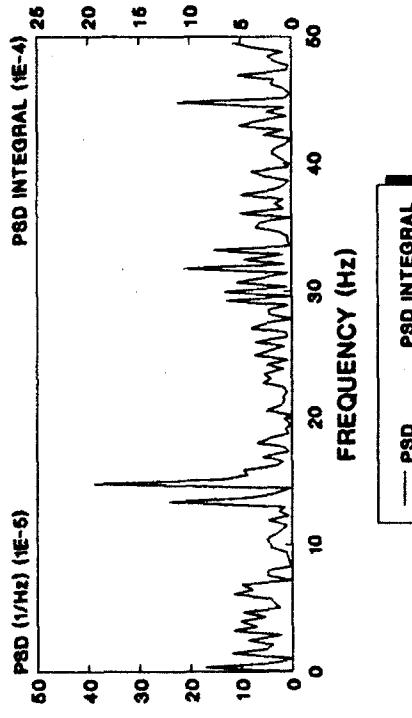
MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



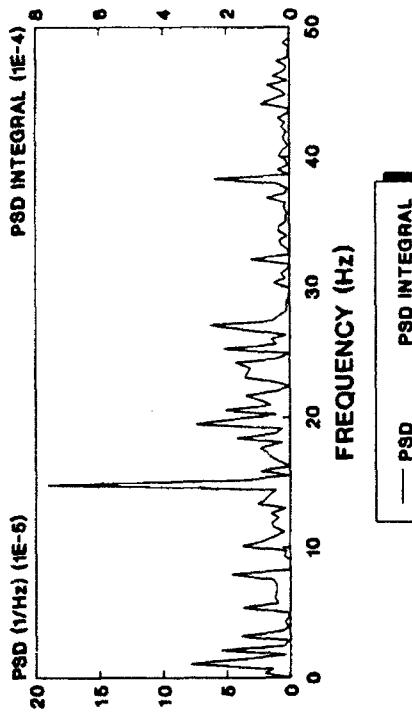
MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL



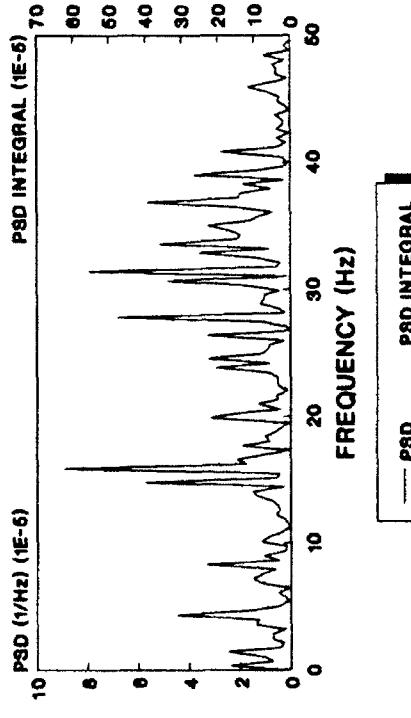
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



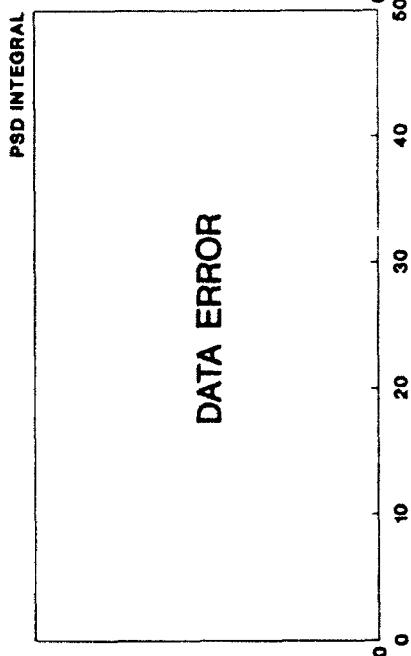
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



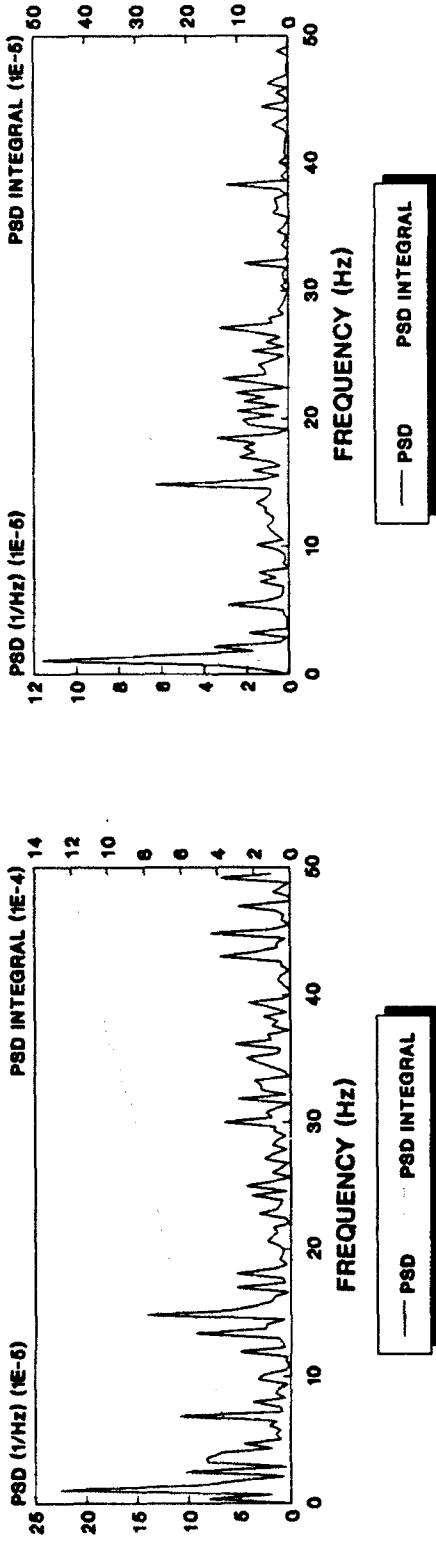
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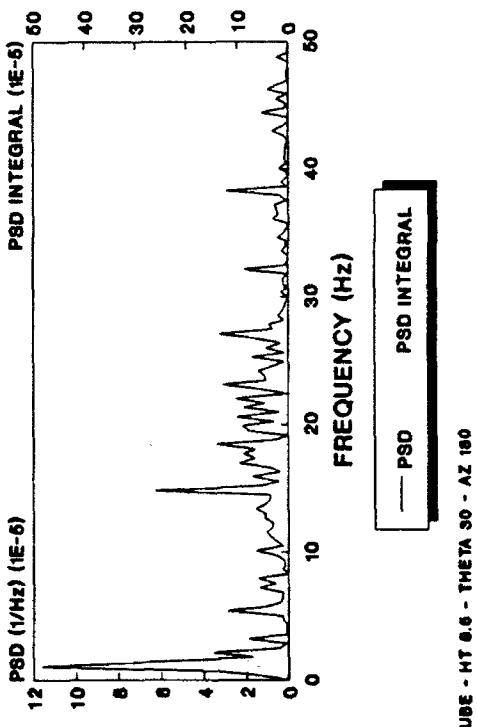
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



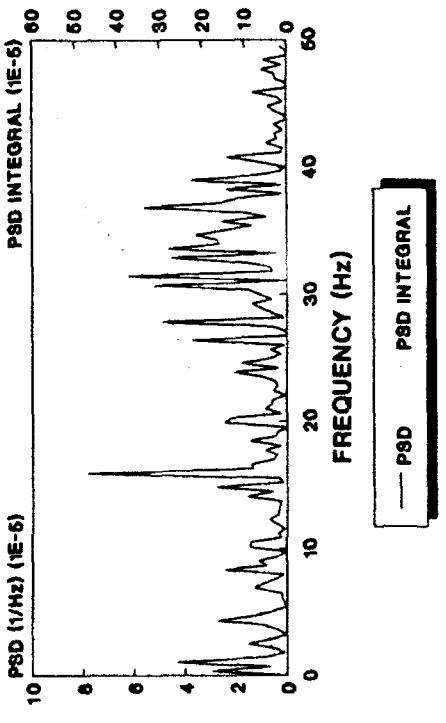
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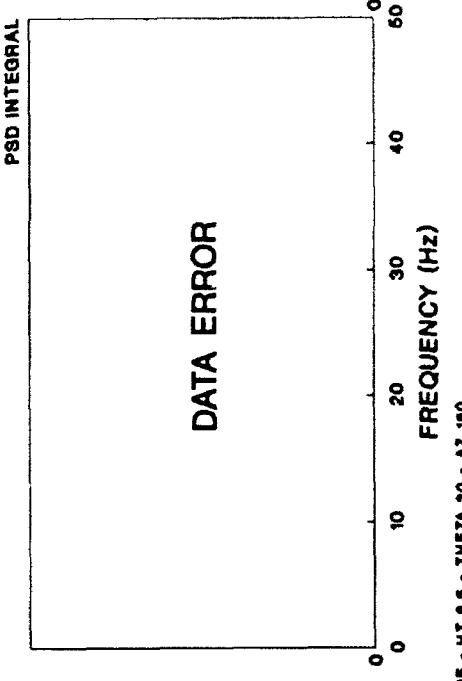
MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



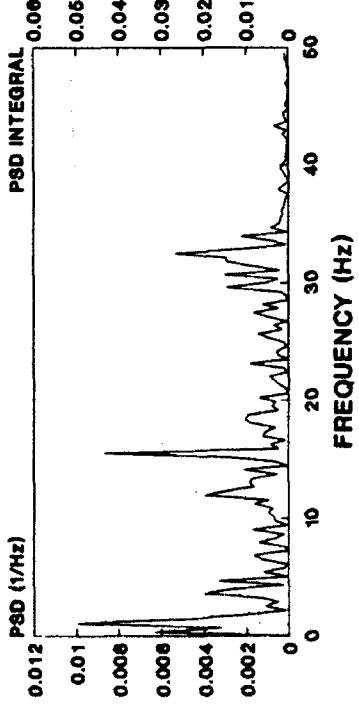
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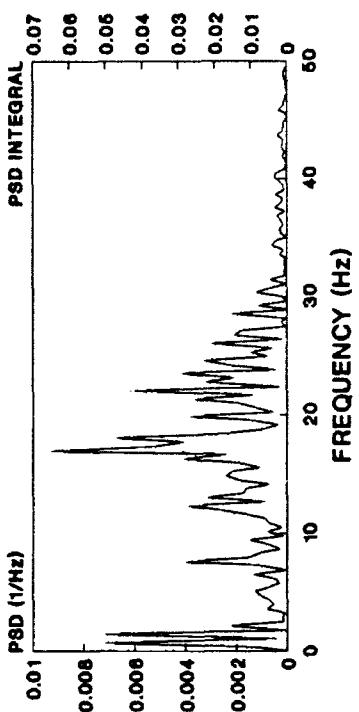
MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



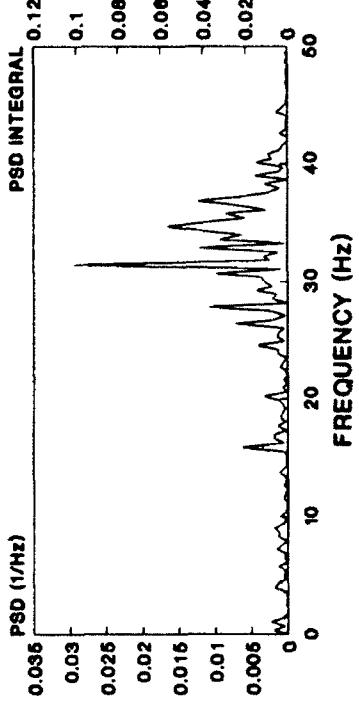
MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



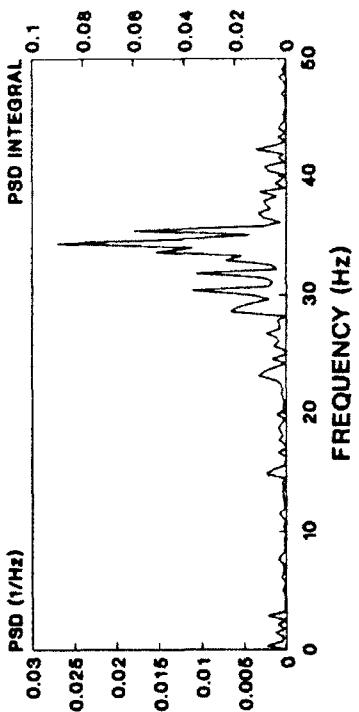
MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



DATA REPORT

SHAPE:	CUBE
DECLINATION [THETA (degrees)]:	45
DIMENSIONS [LxWxH (in)]:	11.1 x 7.88 x 8.31
WEIGHT (gm):	1029.5
TORSION FREQUENCY (Hz):	30
LATERAL (SIDE BEND) FREQUENCY (Hz):	61
NORMAL (AFT BEND) FREQUENCY (Hz):	81
AZIMUTHS (degrees):	0, 30, 45, 60, 90, 120, 135, 150, 180

GRAPH CORRECTIONS:

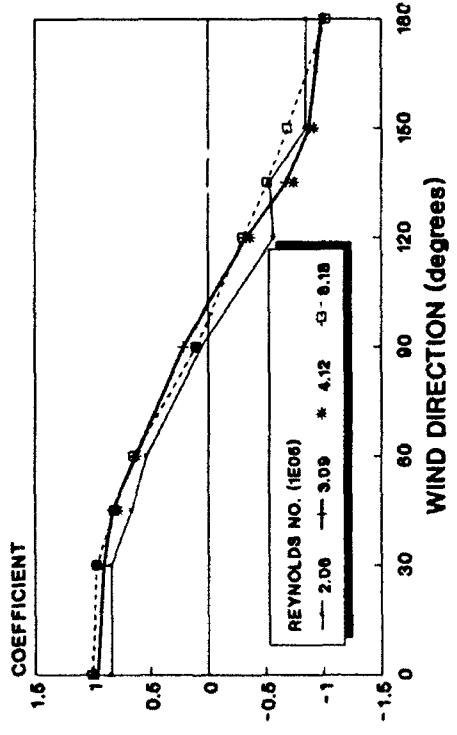
- The mean value of the **ROLL** moment coefficients should be divided by 12.
- The PSD and PSD Integral values of the **ROLL** moment coefficients should be divided by 144.

OBSERVATIONS:

- Very good shedding is seen in the normal data at 90 degrees azimuth. The shed tends to be single frequency with the exception of 120 ft/sec tunnel speed which seems to be multifrequency. Two frequency spikes are seen in the 90 ft/sec data but one of the spikes is the 15.176 Hz spike that shows up in much of the data and is probably not a true shed.
- Very good shedding is seen in the lateral data at 150 degrees azimuth. The shed may be contaminated at 180 ft/sec by the 30 Hz torsional frequency which is present in most of the data. Evidence of the shedding can also be seen in the normal data.

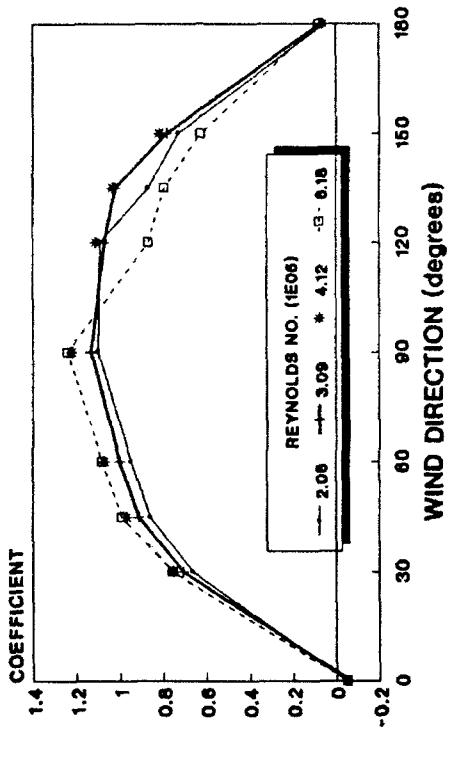
- Good shedding can be seen in the lateral and roll data at 30 and 135 degrees azimuth. The shed merges with the torsional frequency at wind speeds of 180 ft/sec making analysis difficult. Evidence of the shedding can also be seen in the normal data but it is not as strong.
- Poor shedding can be seen in the data at 120 degrees azimuth.

MEAN FORCE COEFFICIENT
NORMAL DIRECTION



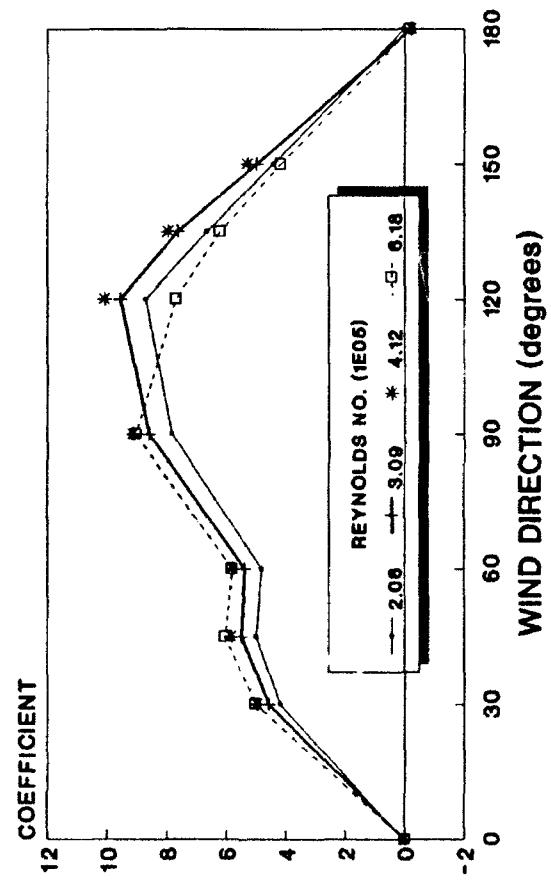
CUBE - THETA 46

MEAN FORCE COEFFICIENT
LATERAL DIRECTION

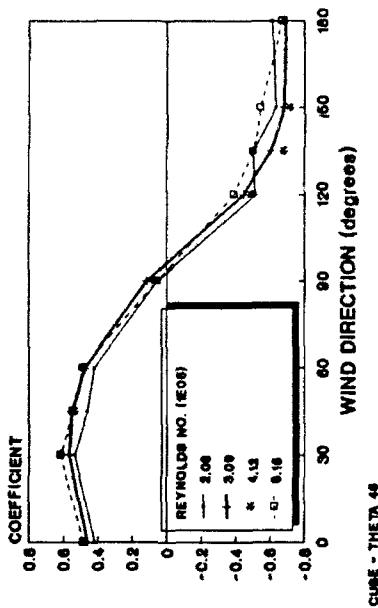


CUBE - THETA 46

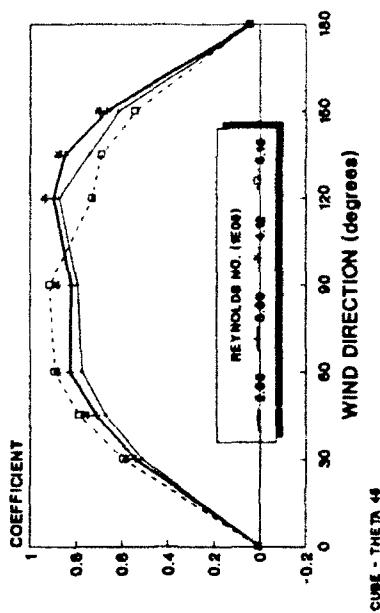
MEAN MOMENT COEFFICIENT ROLL DIRECTION



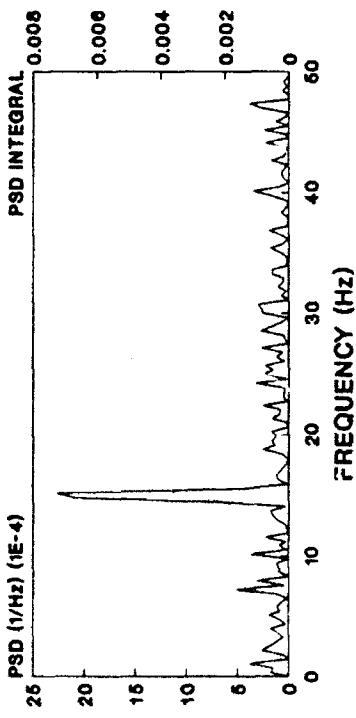
MEAN MOMENT COEFFICIENT NORMAL DIRECTION



MEAN MOMENT COEFFICIENT LATERAL DIRECTION

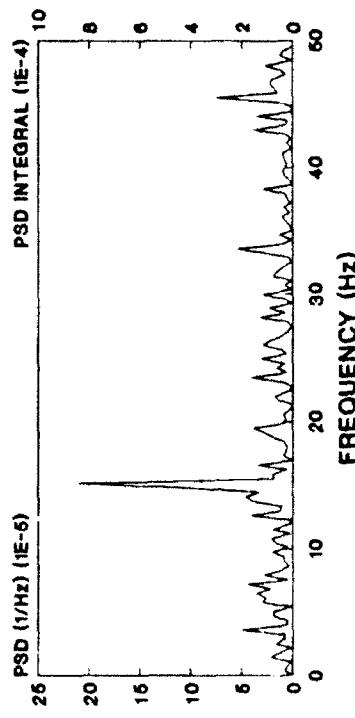


FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



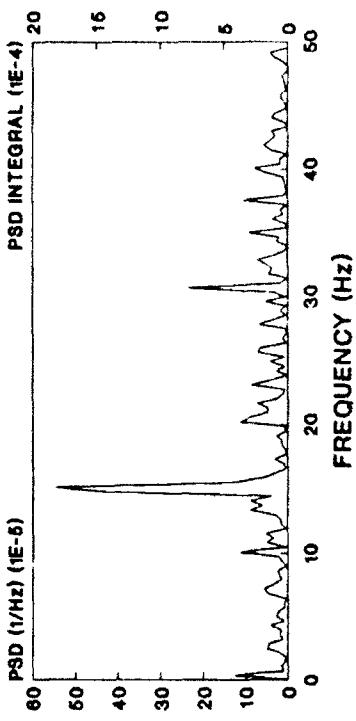
CUBE - HT 8.31 - THETA 45 - AZ 000

FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



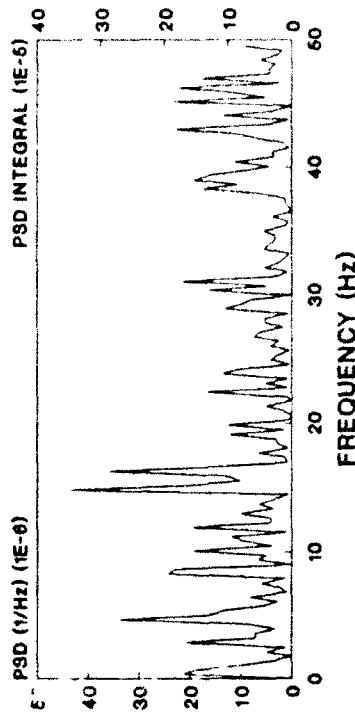
CUBE - HT 8.31 - THETA 45 - AZ 000

FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



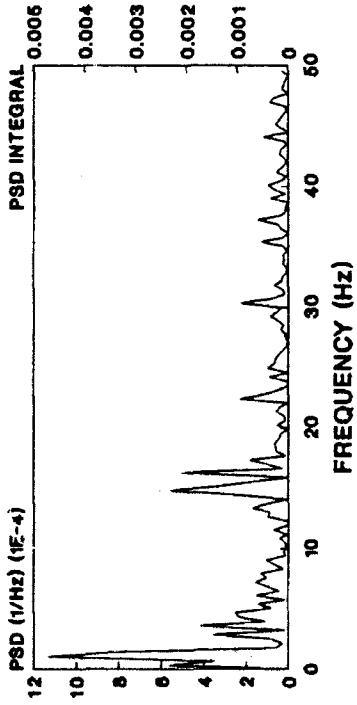
CUBE - HT 8.31 - THETA 45 - AZ 000

FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



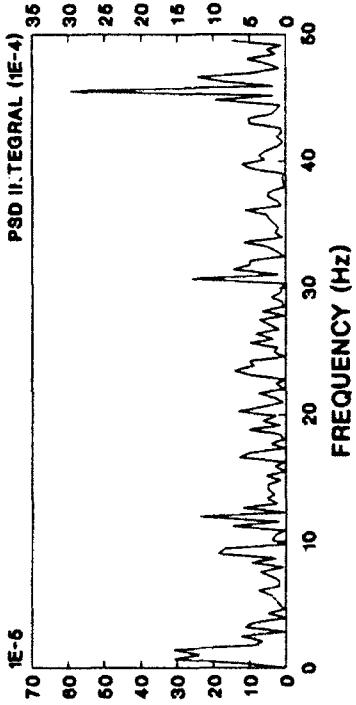
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MOMENT COEFF - NORMAL 60 FT/SEC NOMINAL



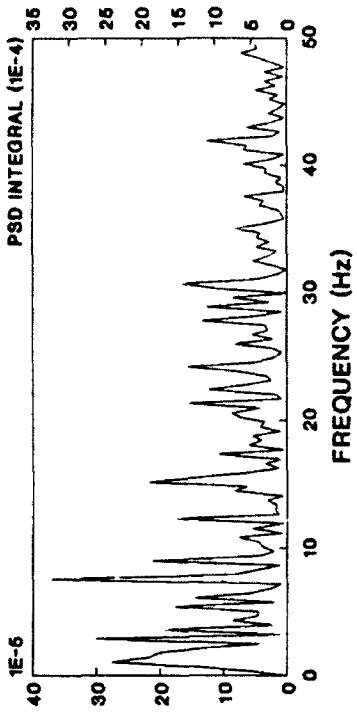
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MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



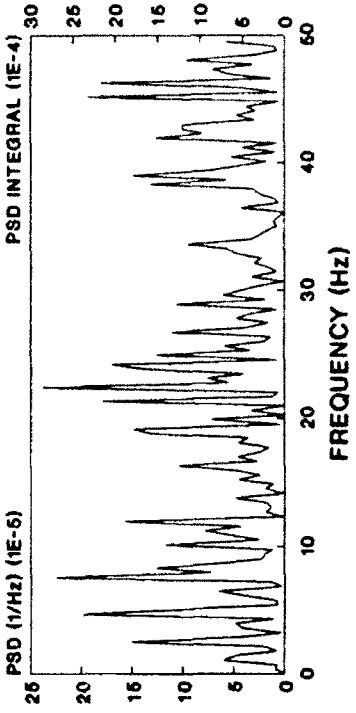
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MOMENT COEFF - NORMAL 90 FT/SEC NOMINAL



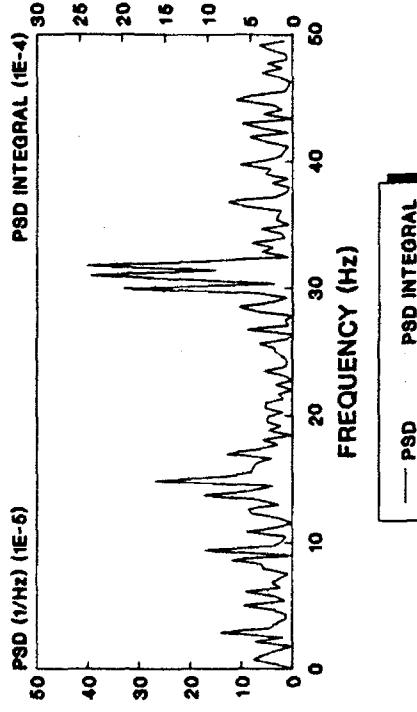
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MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL



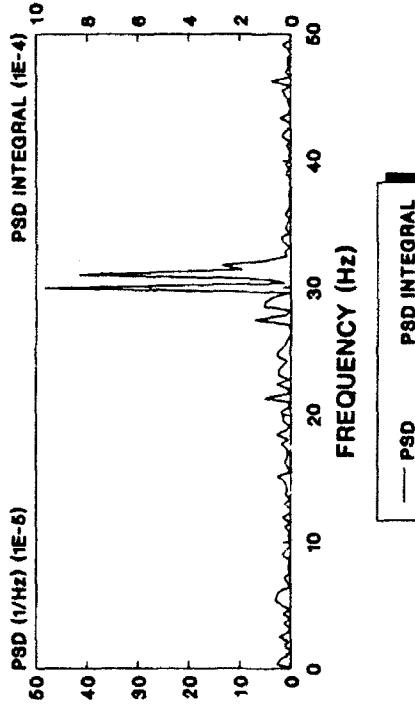
CUBE - HT 0.31 - THETA 45 - AZ 000

FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



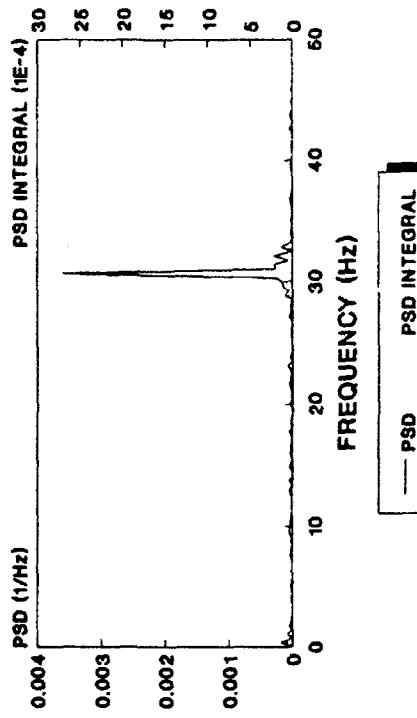
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FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



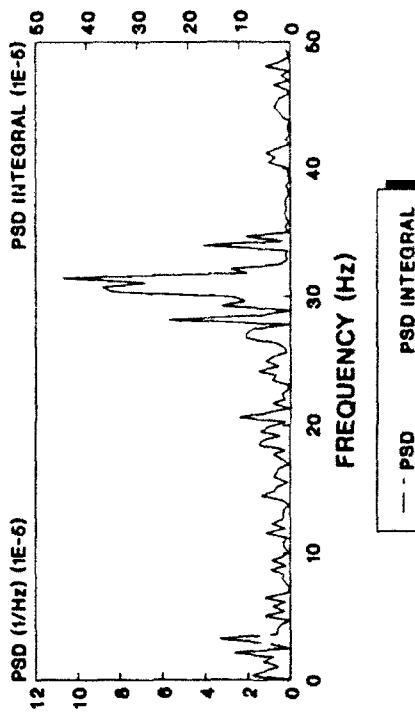
CUBE - HT 0.31 - THETA 46 - AZ 000

FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



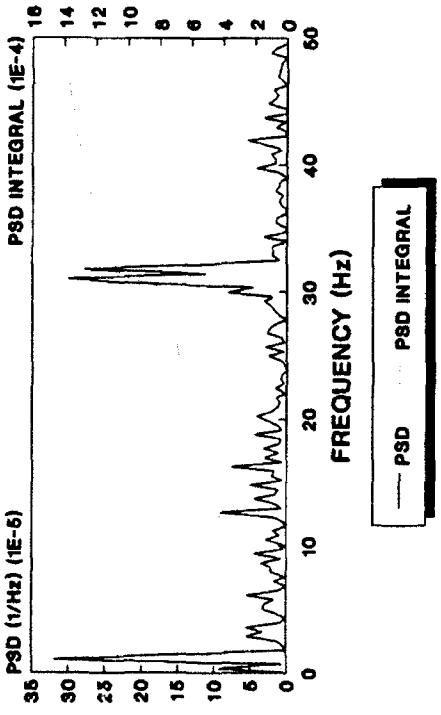
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FORCE COEFF - LATERAL 180 FT/SEC NOMINAL

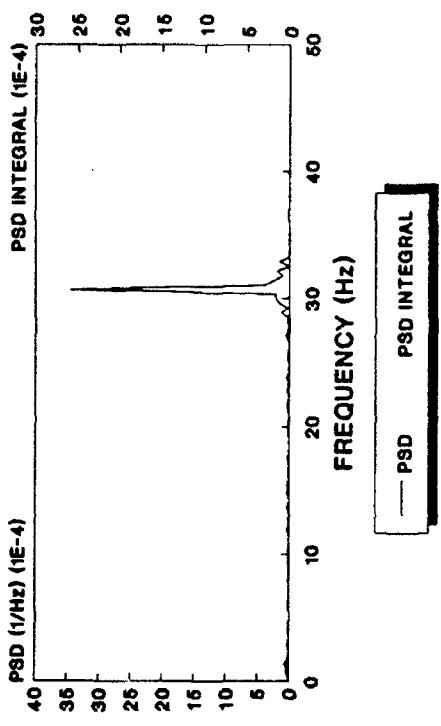


CUBE - HT 0.31 - THETA 46 - AZ 000

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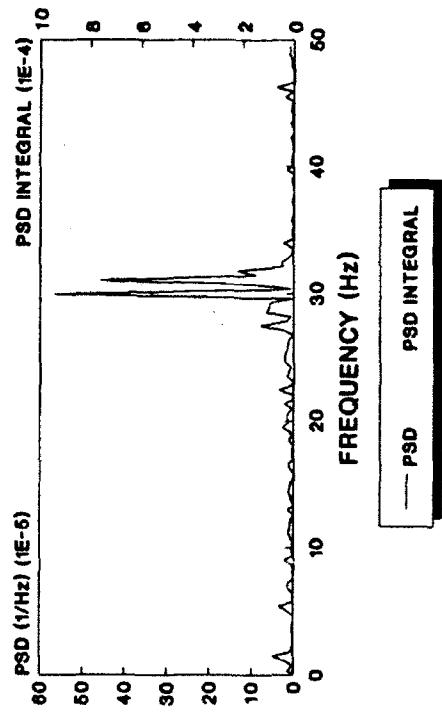


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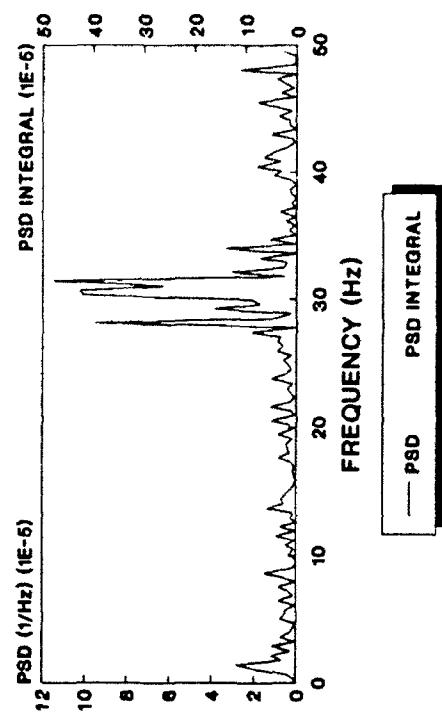
CUBE - HT 8.31 - THETA 46 - AZ 000

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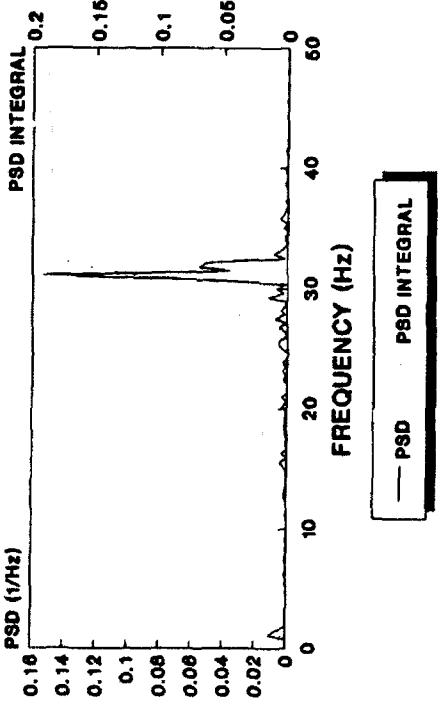
122

MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL

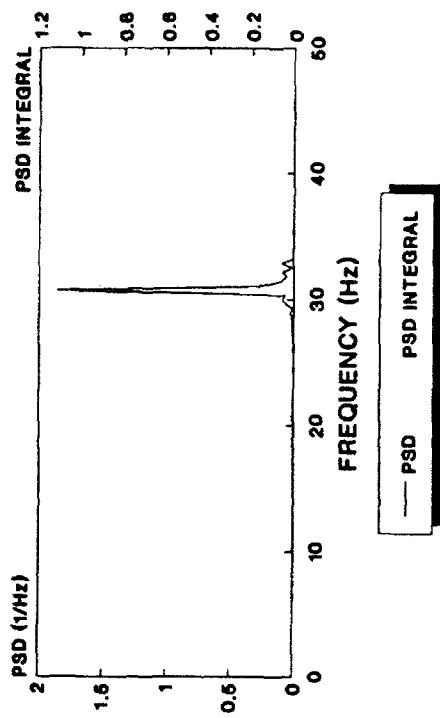


CUBE - HT 8.31 - THETA 46 - AZ 000

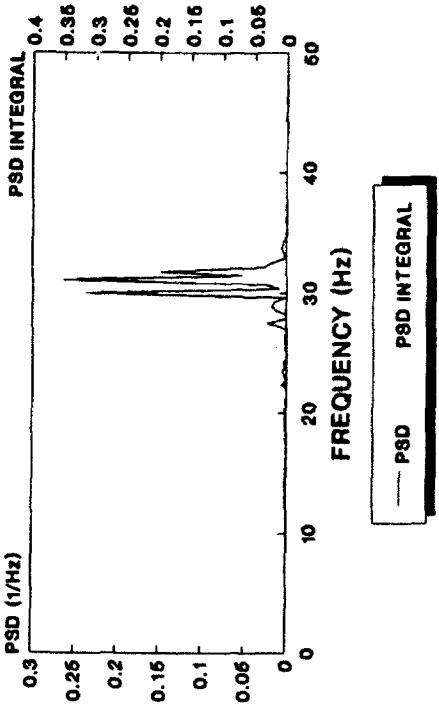
MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



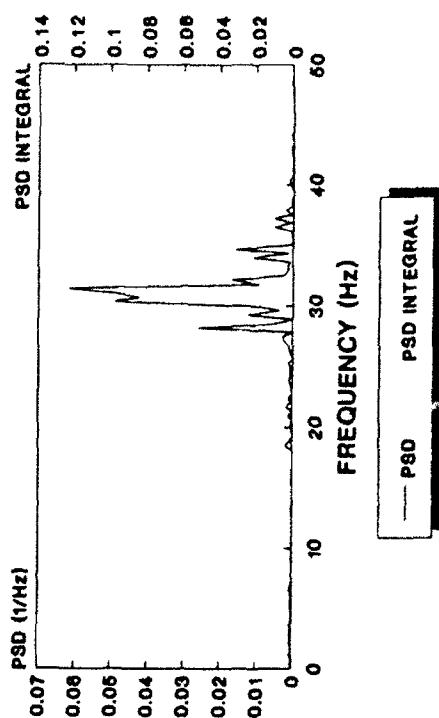
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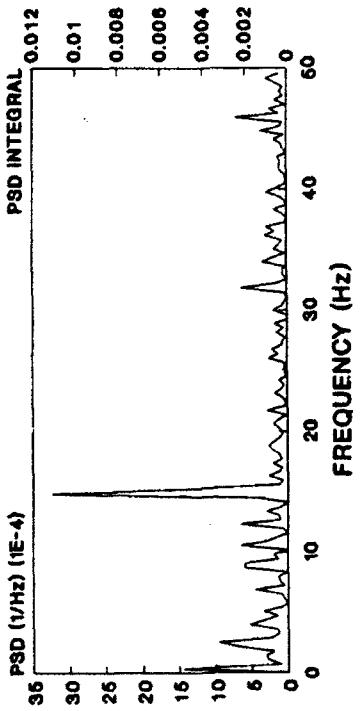
MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

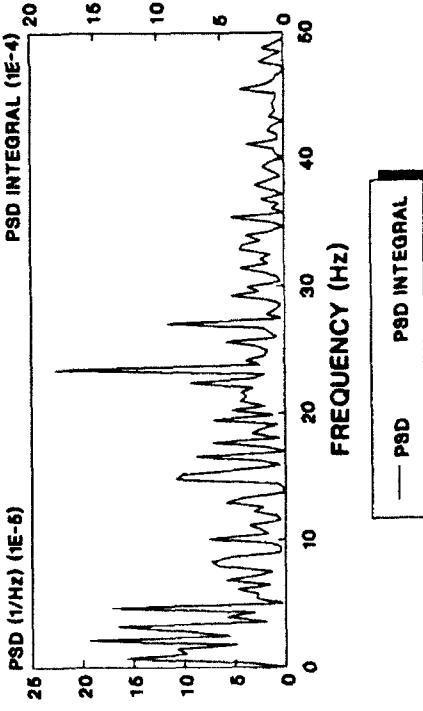


FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



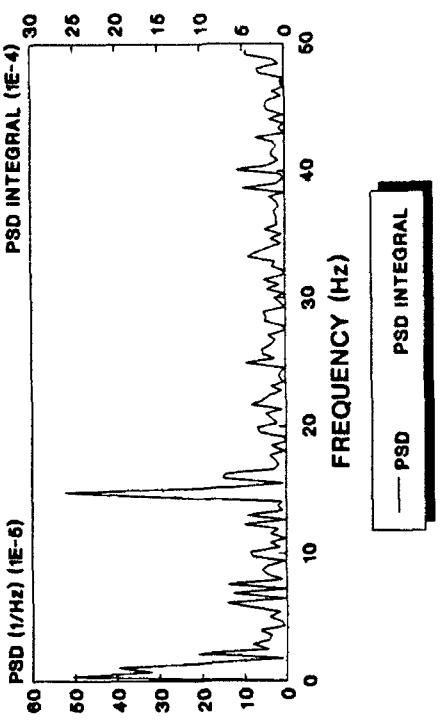
CUBE - HT 0.31 - THETA 45 - AZ 030

FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



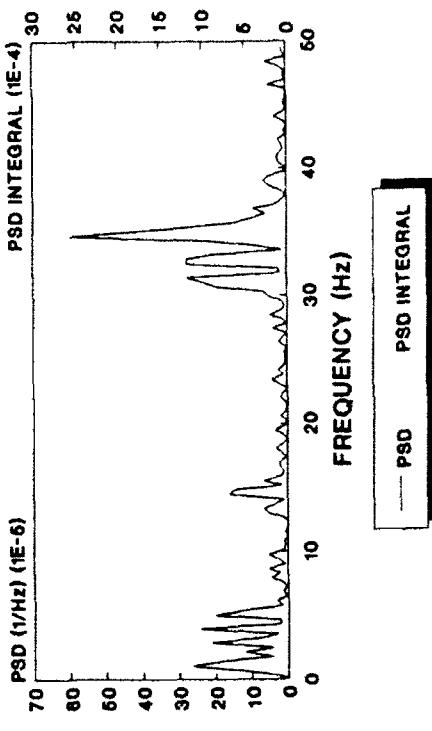
CUBE - HT 0.31 - THETA 45 - AZ 030

FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



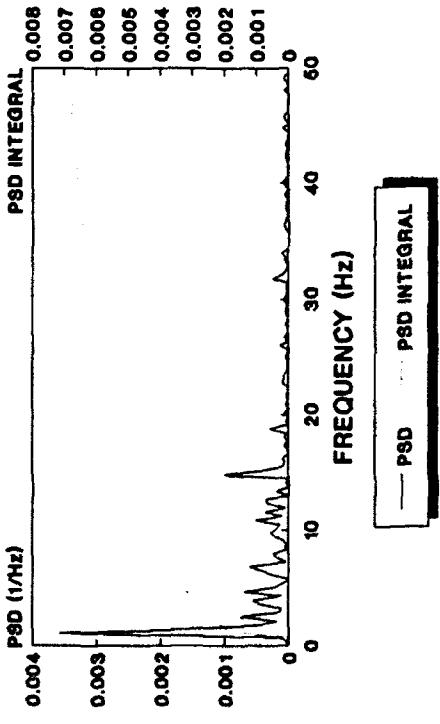
CUBE - HT 0.31 - THETA 45 - AZ 030

FORCE COEFF - NORMAL 180 FT/SEC NOMINAL

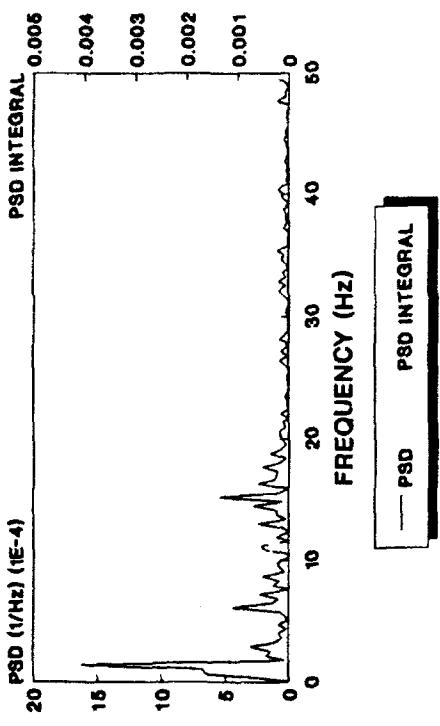


CUBE - HT 0.31 - THETA 45 - AZ 030

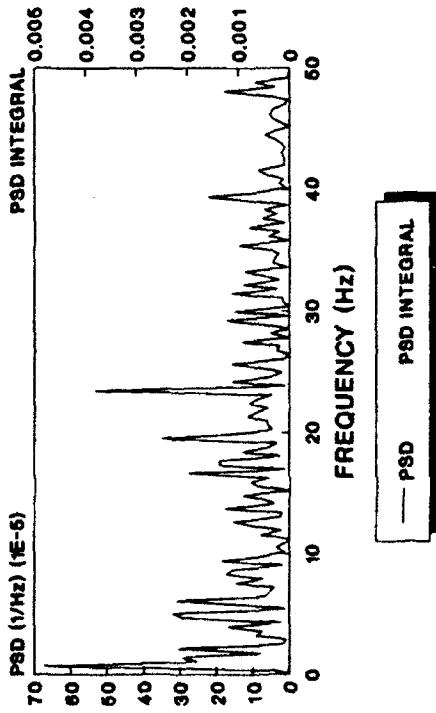
**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



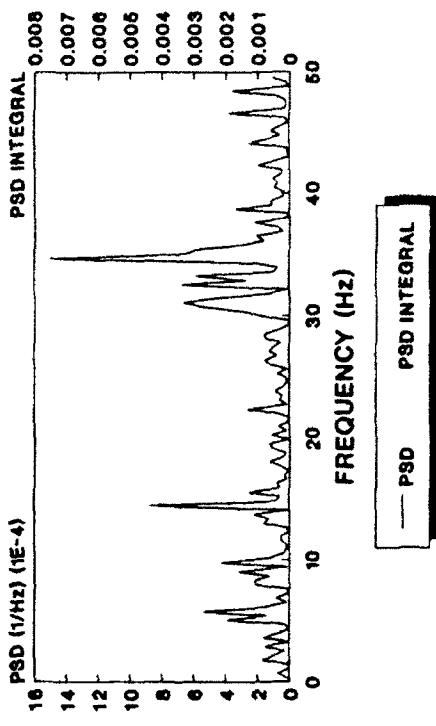
**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



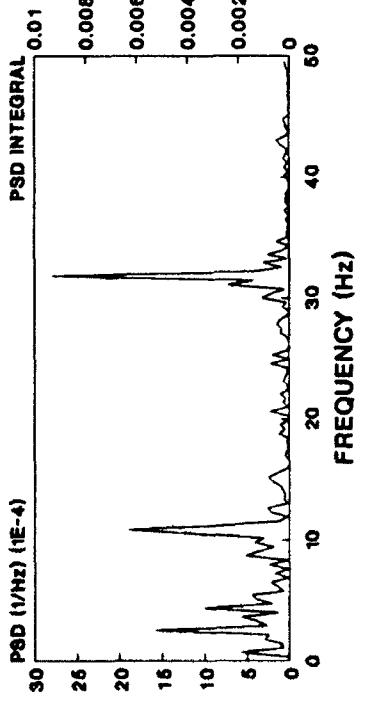
**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



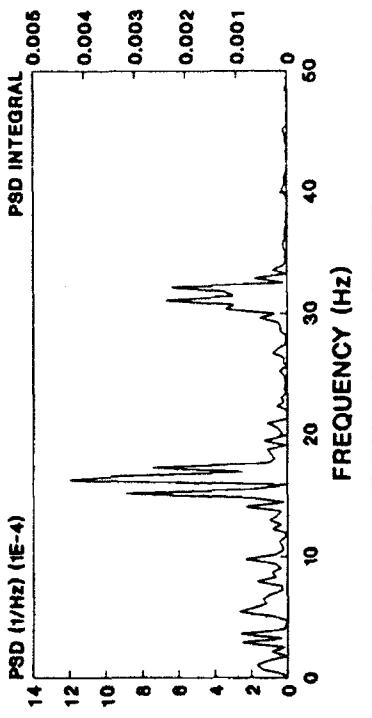
**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



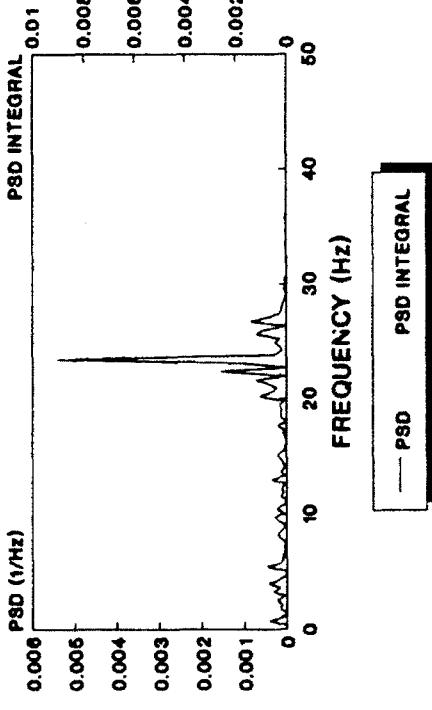
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



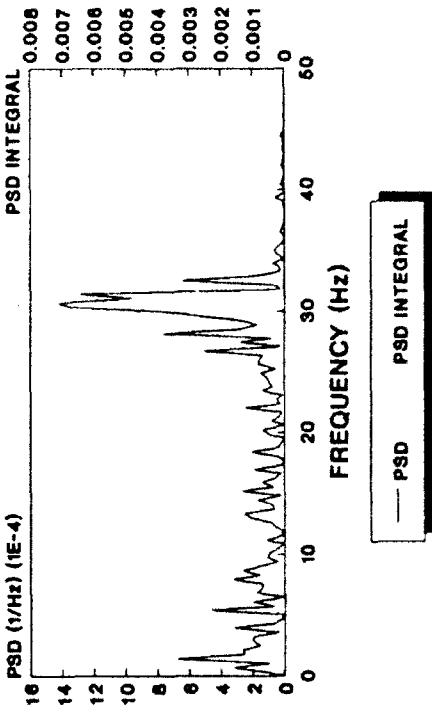
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



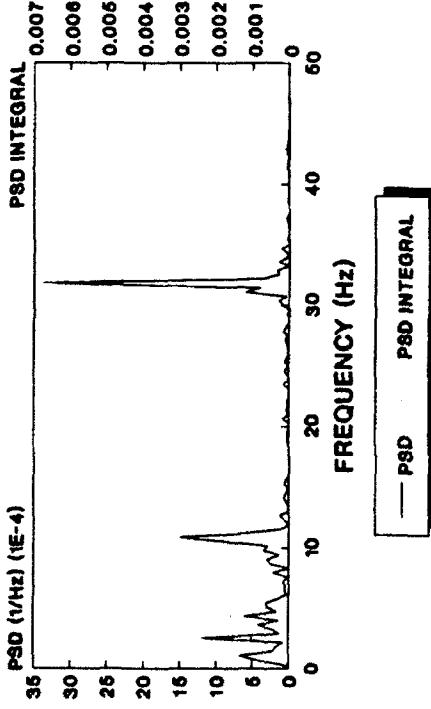
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



FORCE COEFF - LATERAL 180 FT/SEC NOMINAL

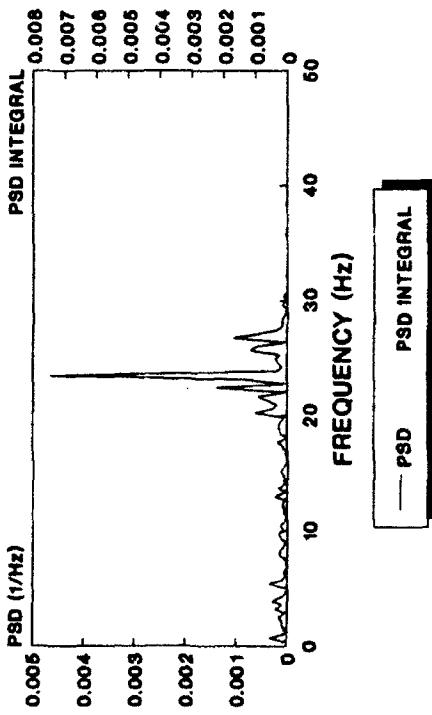


MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



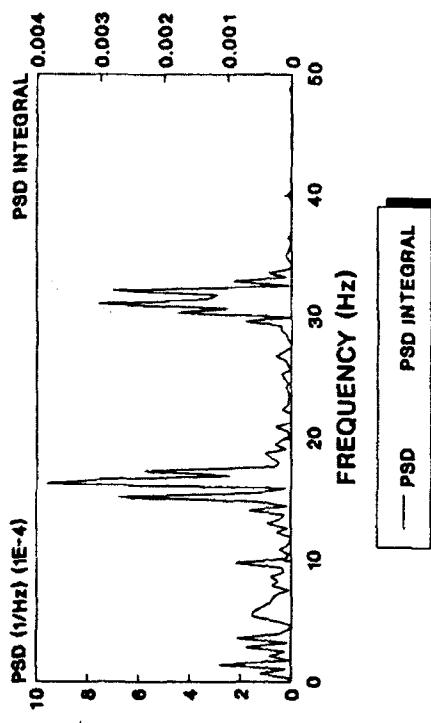
CUBE - HT 8.31 - THETA 45 - AZ 030

MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



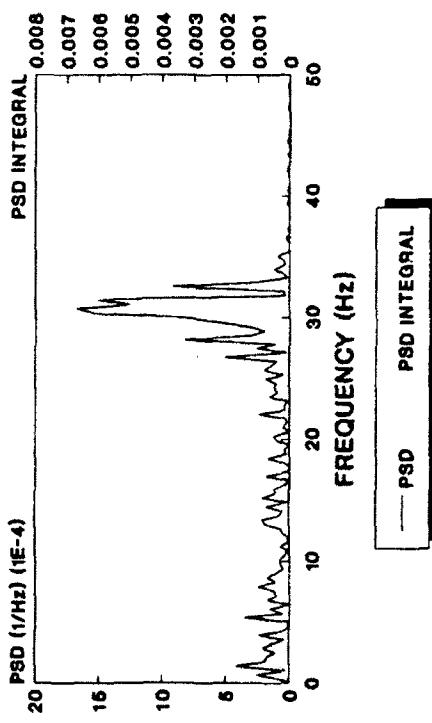
CUBE - HT 8.31 - THETA 45 - AZ 030

MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



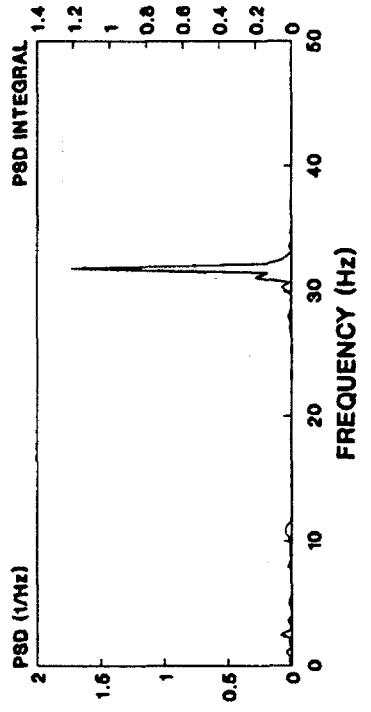
CUBE - HT 8.31 - THETA 45 - AZ 030

MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



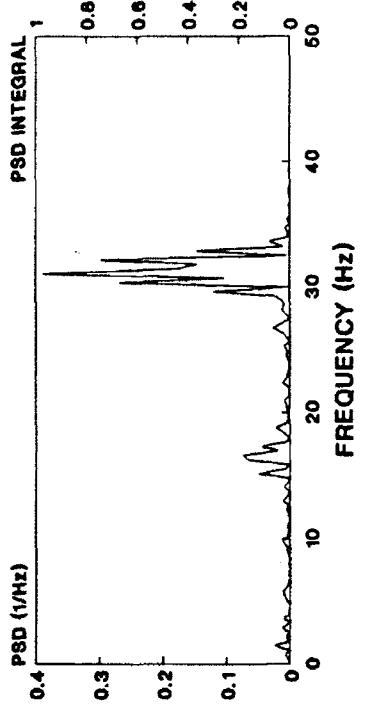
CUBE - HT 8.31 - THETA 45 - AZ 030

MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



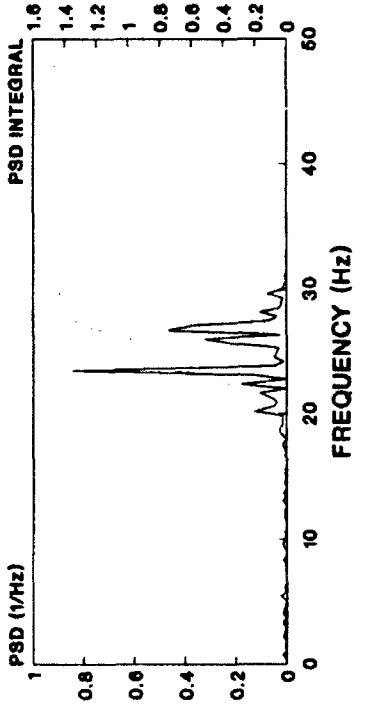
CUBE - HT 6.31 - THETA 46 - AZ 030

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



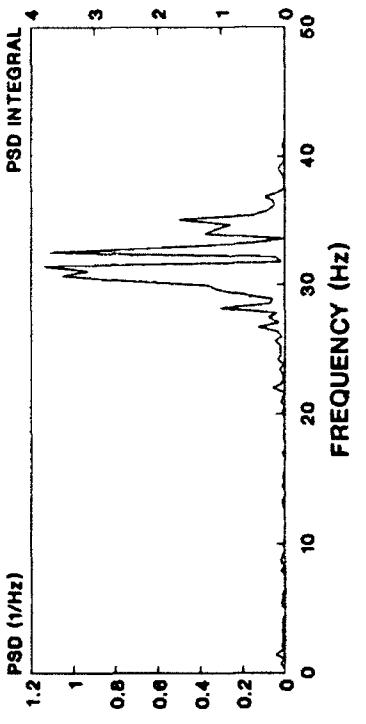
CUBE - HT 6.31 - THETA 46 - AZ 030

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



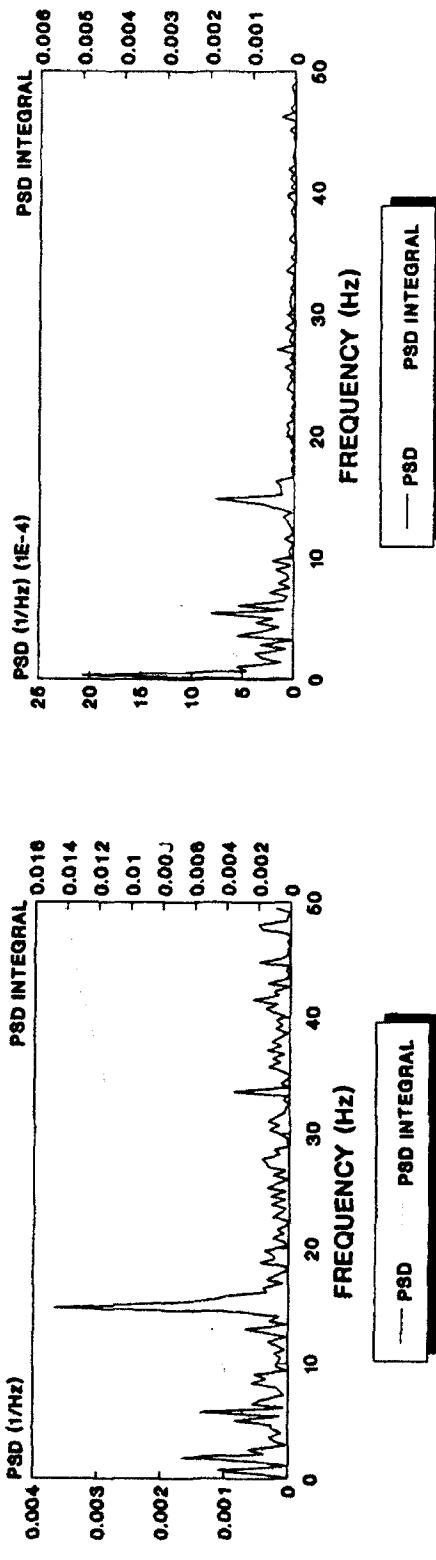
CUBE - HT 6.31 - THETA 46 - AZ 030

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

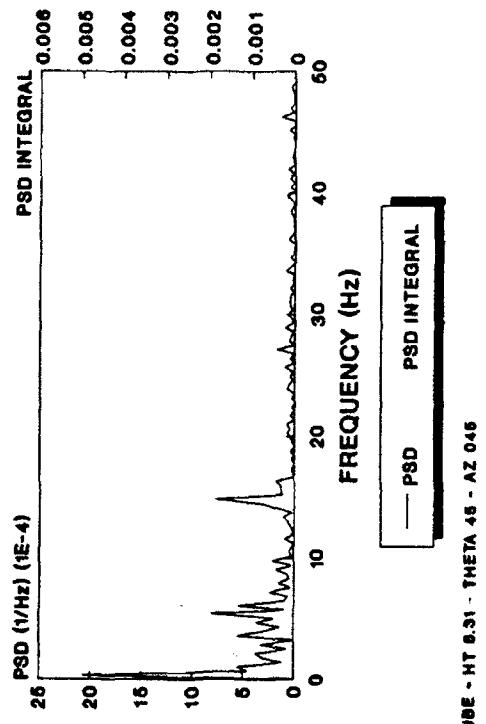


CUBE - HT 6.31 - THETA 46 - AZ 030

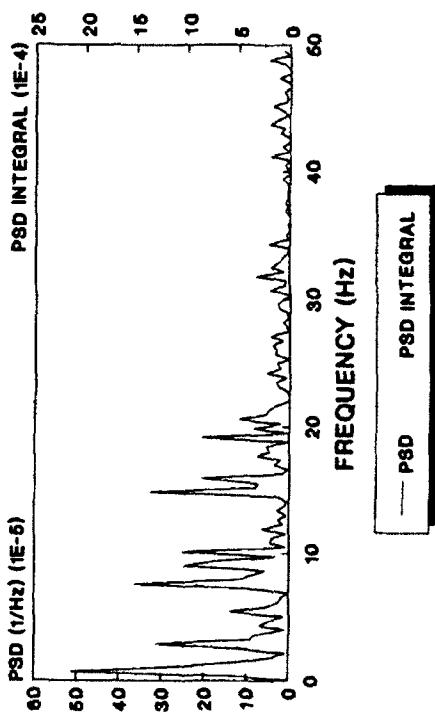
**FORCE COEFF - NORMAL
60 FT/SEC NOMINAL**



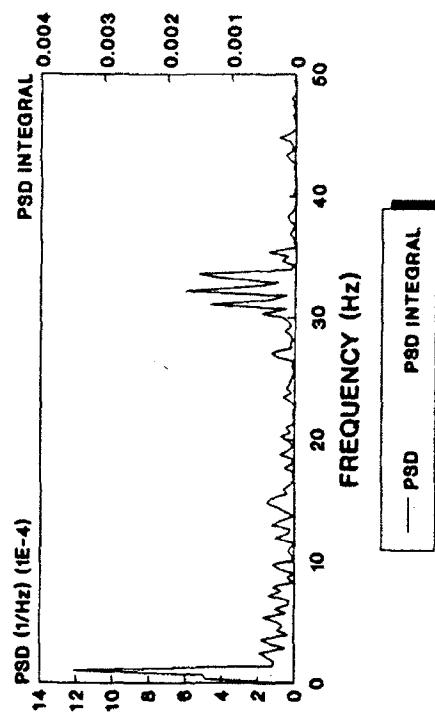
**FORCE COEFF - NORMAL
90 FT/SEC NOMINAL**



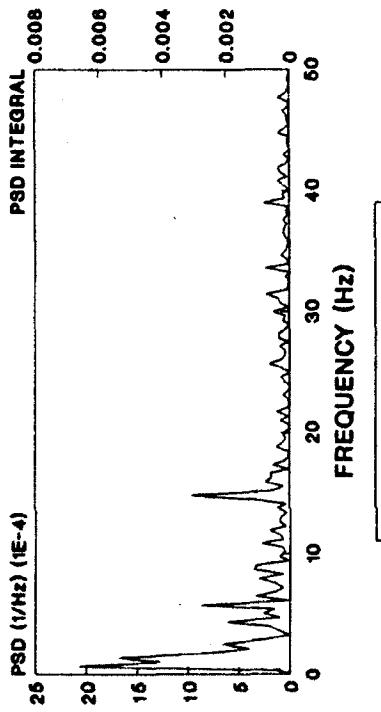
**FORCE COEFF - NORMAL
120 FT/SEC NOMINAL**



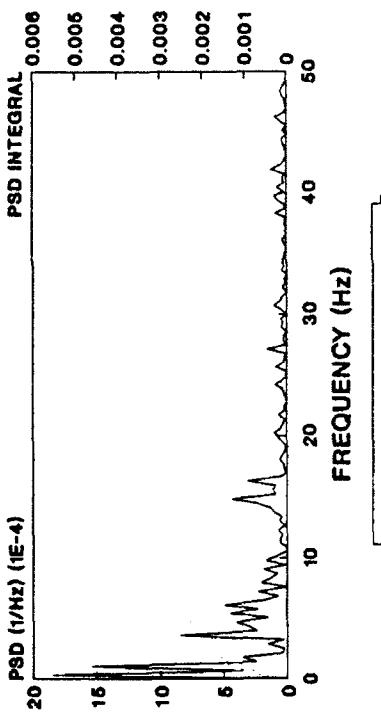
**FORCE COEFF - NORMAL
180 FT/SEC NOMINAL**



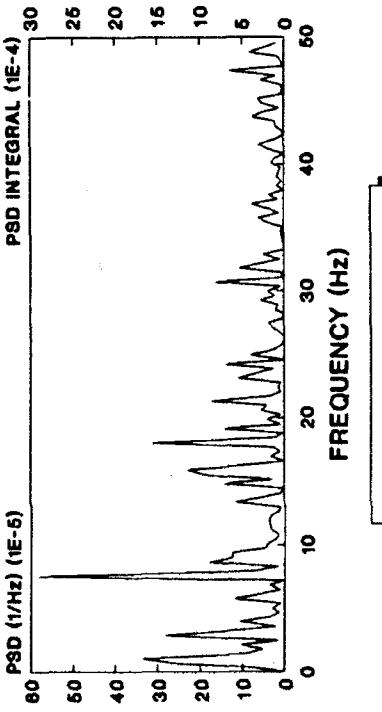
**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



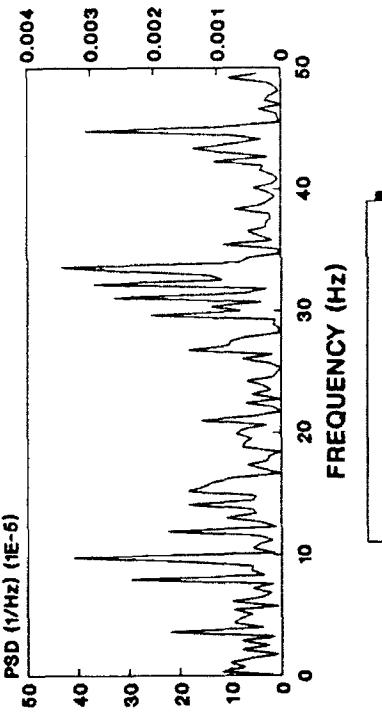
**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



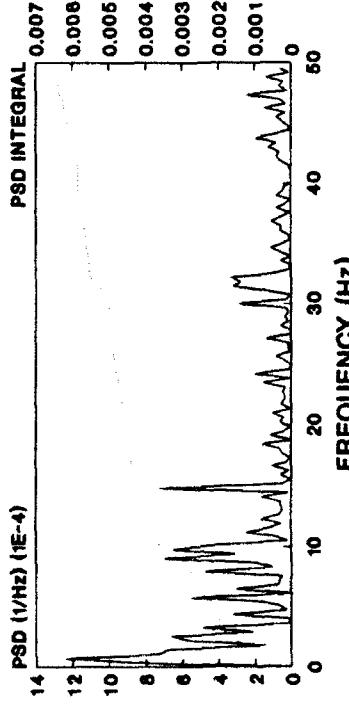
**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



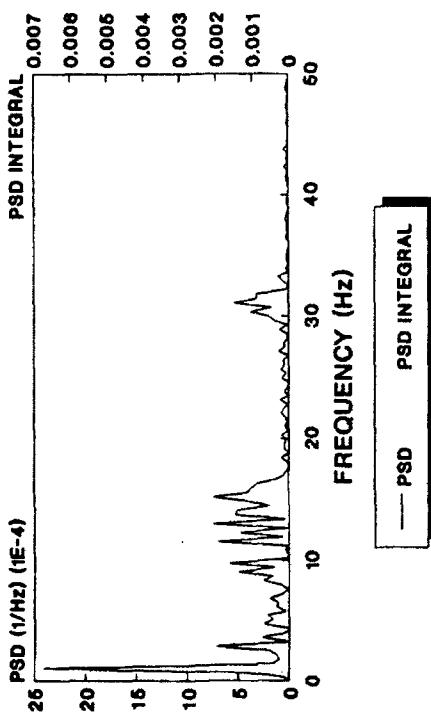
**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



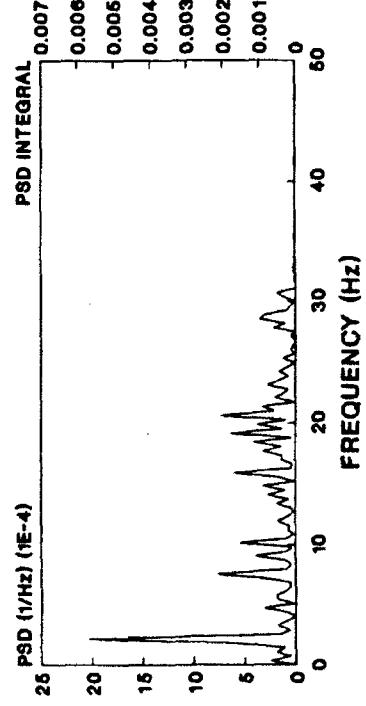
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



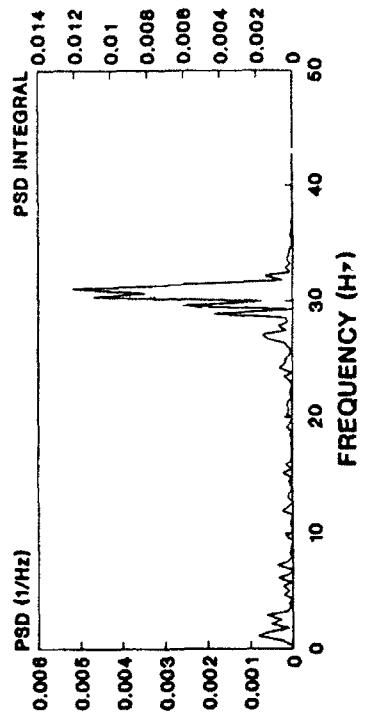
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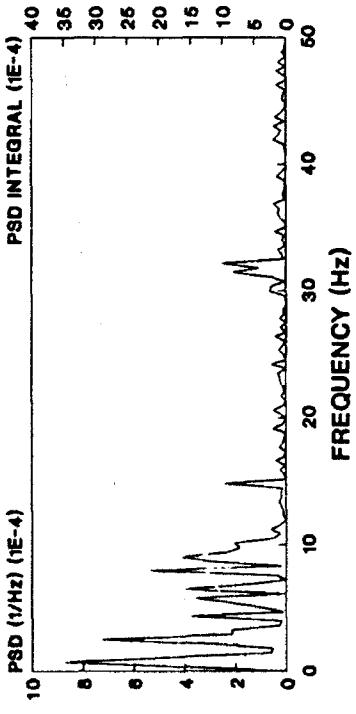
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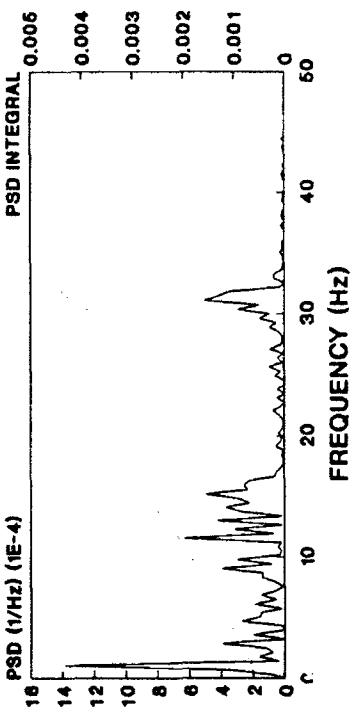
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



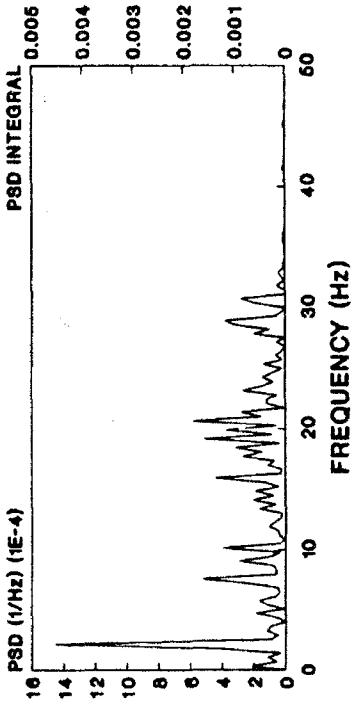
MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



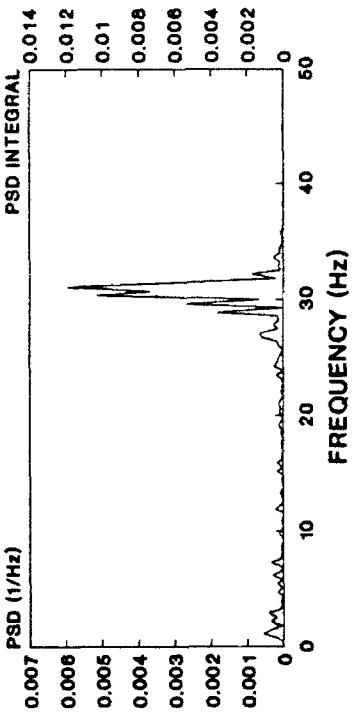
MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



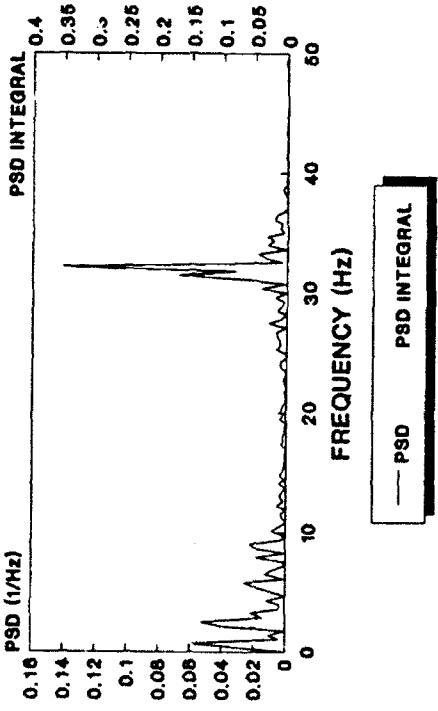
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



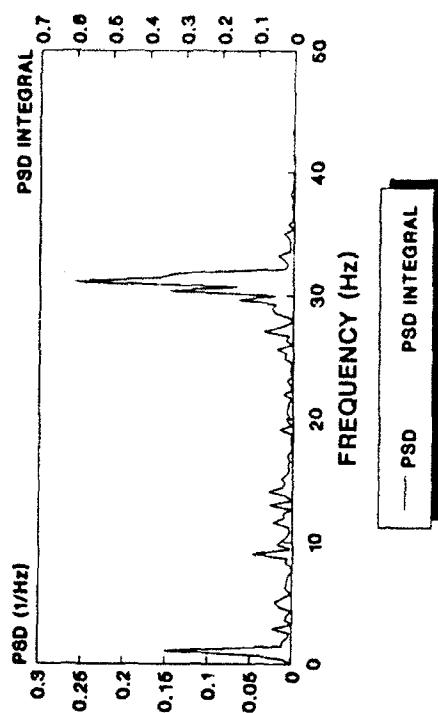
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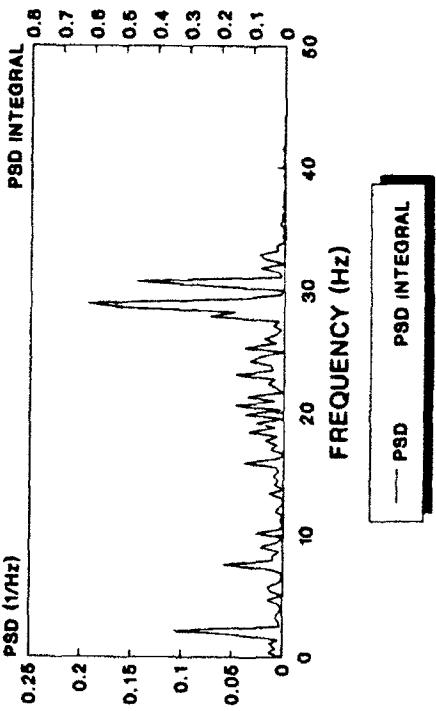
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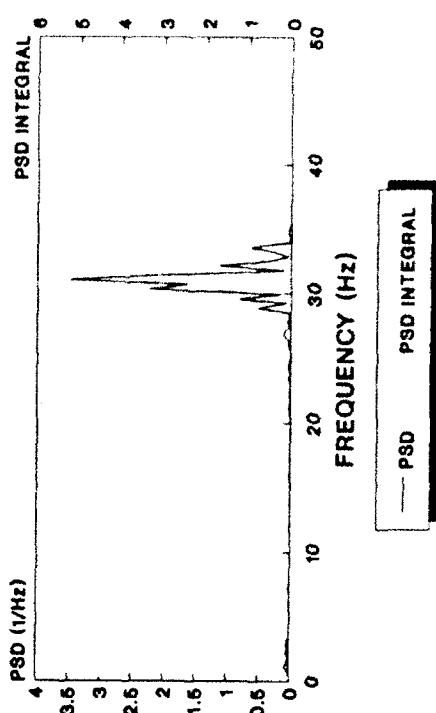
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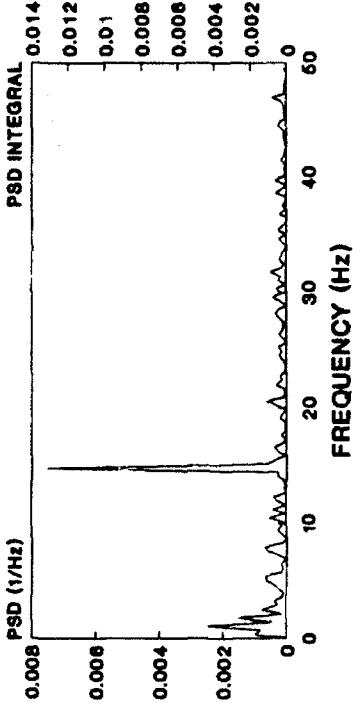
MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

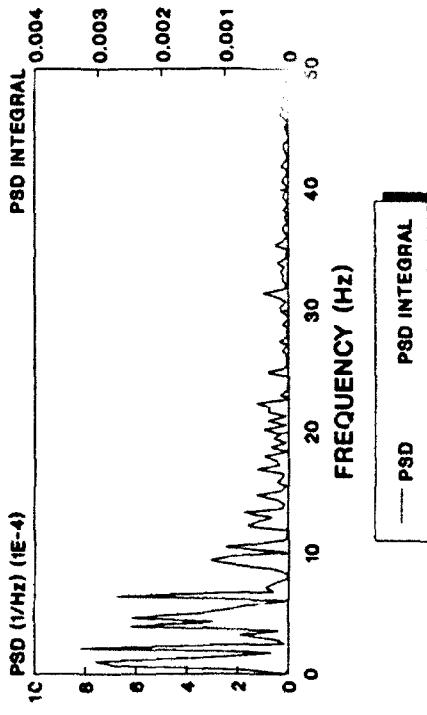


FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



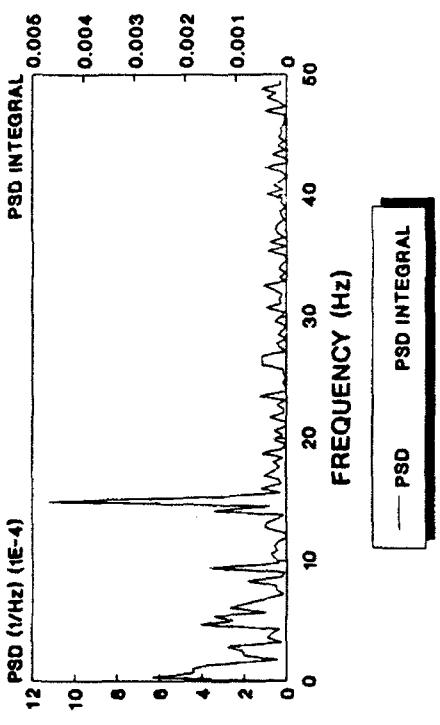
CUBE - HT 8.31 - THETA 45 - AZ 060

FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



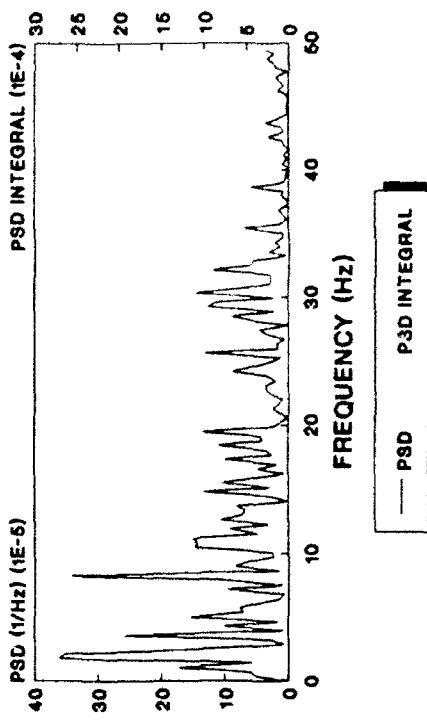
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FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



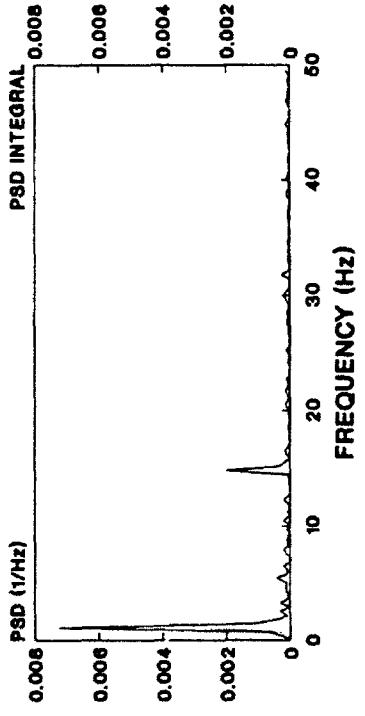
CUBE - HT 8.31 - THETA 45 - AZ 060

FORCE COEFF - NORMAL 180 FT/SEC NOMINAL

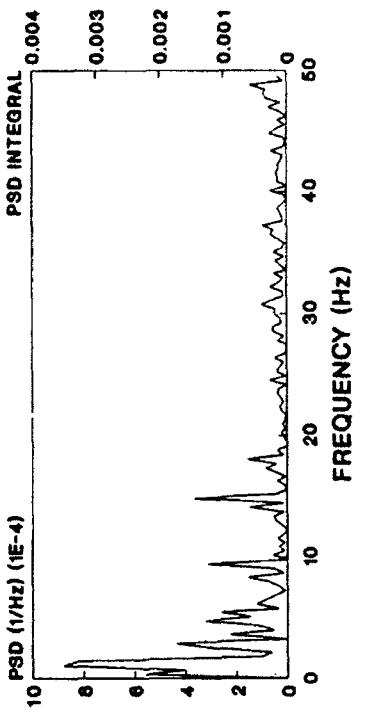


CUBE - HT 8.31 - THETA 45 - AZ 060

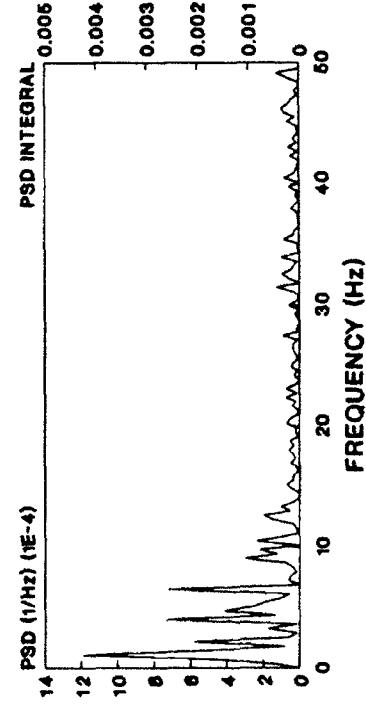
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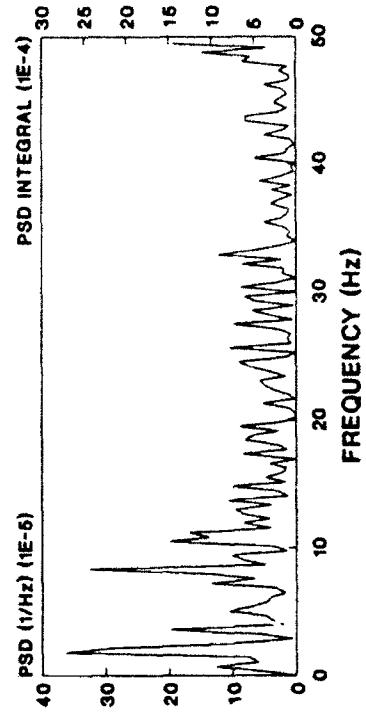
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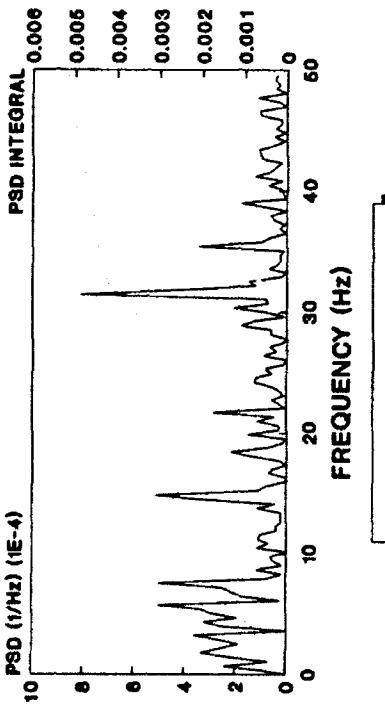
MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL

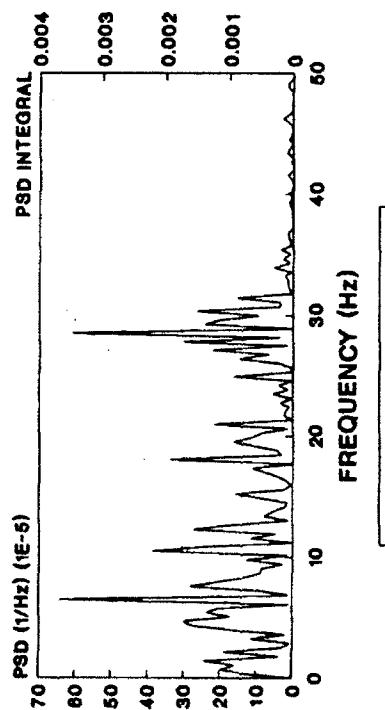


FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



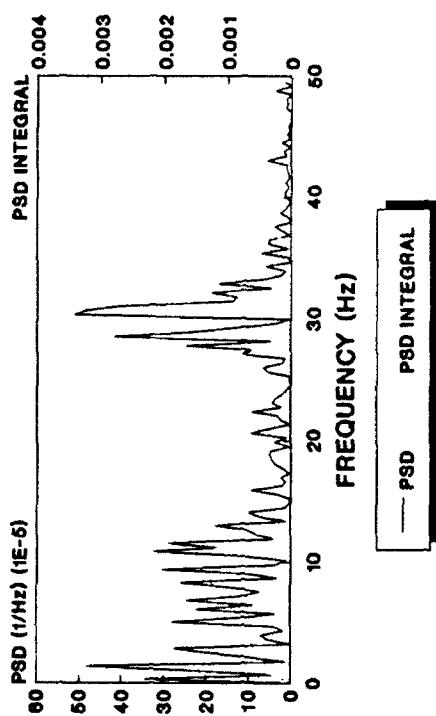
CUBE - HT 0.31 - THETA 46 - AZ 060

FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



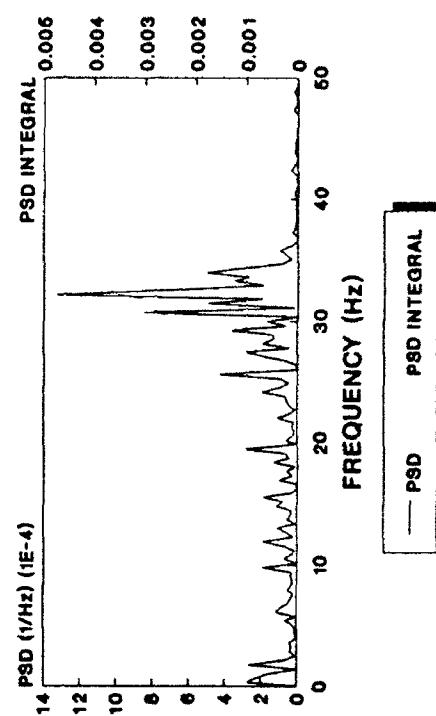
CUBE - HT 0.31 - THETA 46 - AZ 060

FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



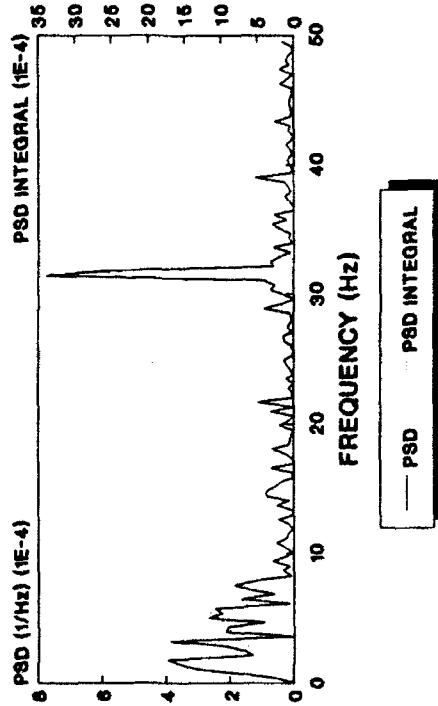
CUBE - HT 0.31 - THETA 46 - AZ 060

FORCE COEFF - LATERAL 180 FT/SEC NOMINAL

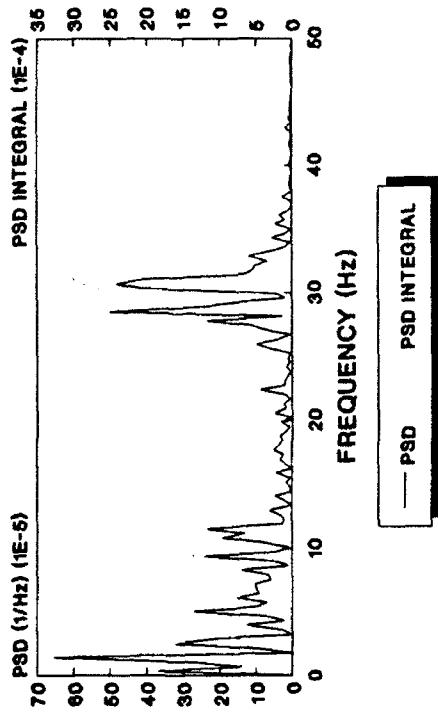


CUBE - HT 0.31 - THETA 46 - AZ 060

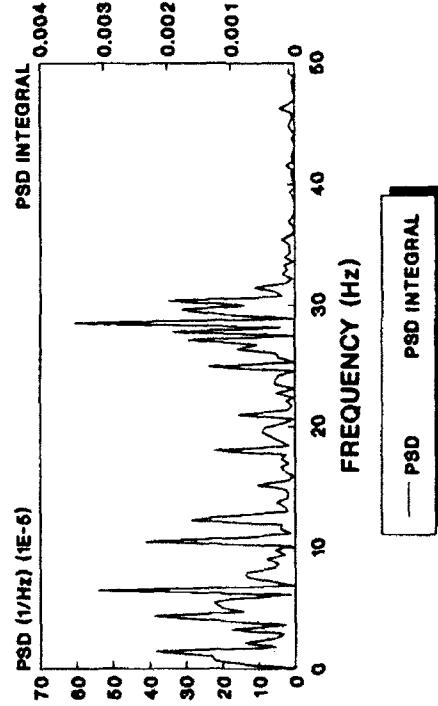
MOMENT COEFF - LATERAL
60 FT/SEC NOMINAL



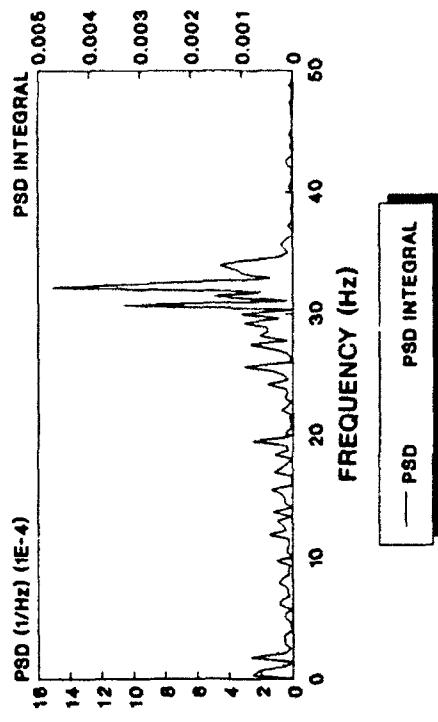
MOMENT COEFF - LATERAL
90 FT/SEC NOMINAL



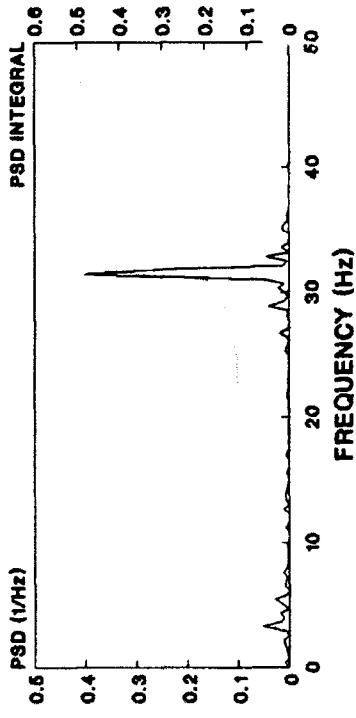
MOMENT COEFF - LATERAL
120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL
180 FT/SEC NOMINAL

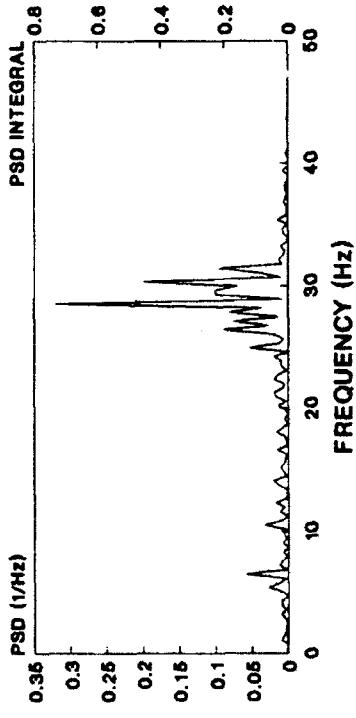


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



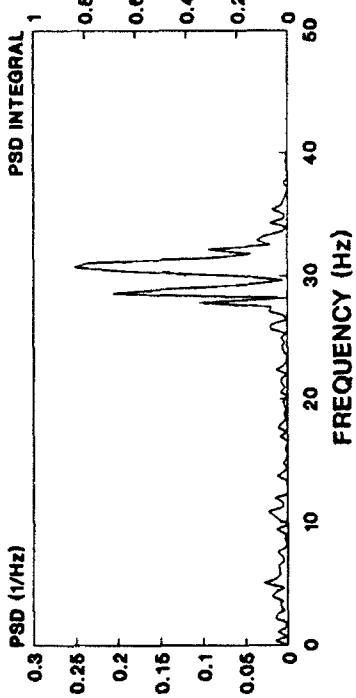
CUBE - HT 6.31 - THETA 45 - AZ 060

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



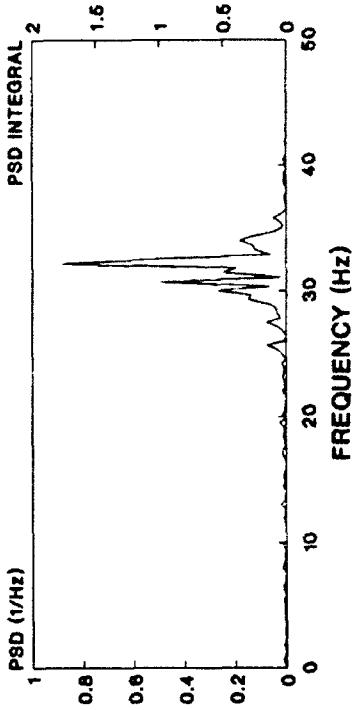
CUBE - HT 6.31 - THETA 45 - AZ 060

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



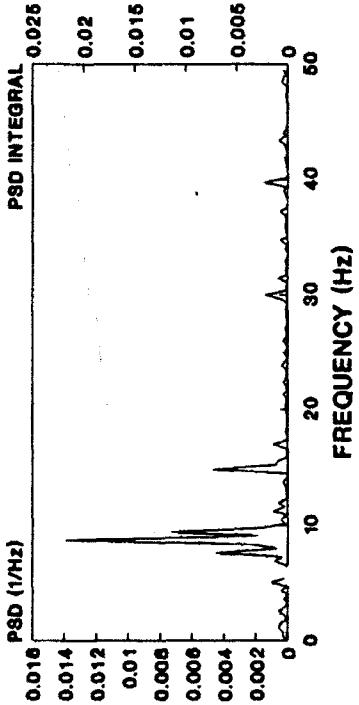
CUBE - HT 6.31 - THETA 45 - AZ 060

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



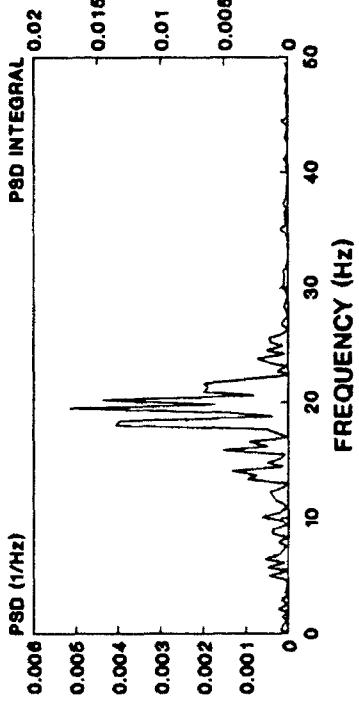
CUBE - HT 6.31 - THETA 45 - AZ 060

FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



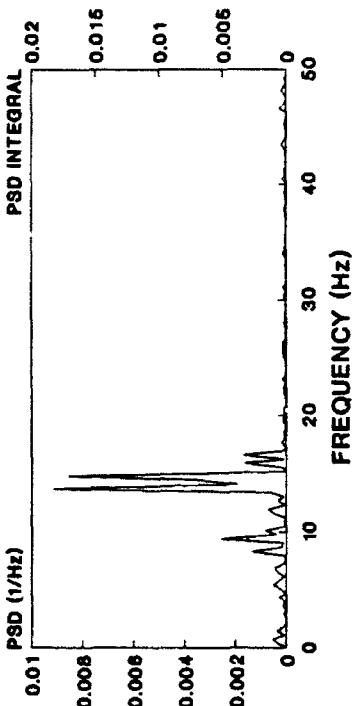
CUBE - HT 8.31 - THETA 46 - AZ 090

FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



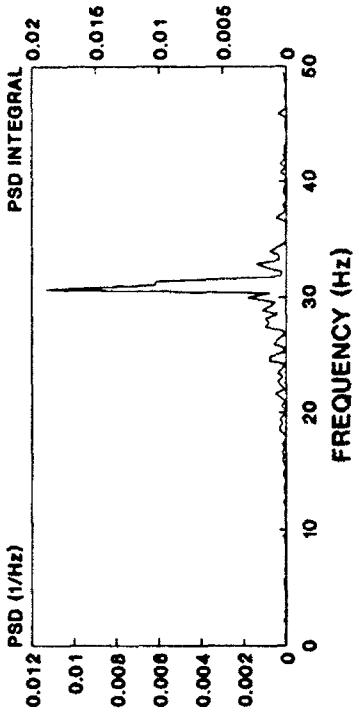
CUBE - HT 8.31 - THETA 46 - AZ 090

FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



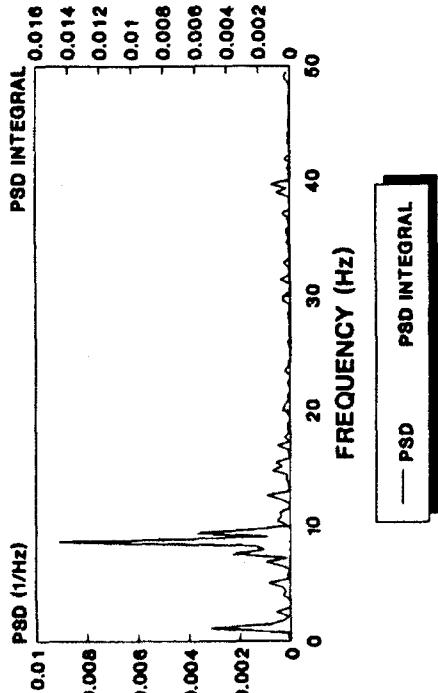
CUBE - HT 8.31 - THETA 46 - AZ 090

FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



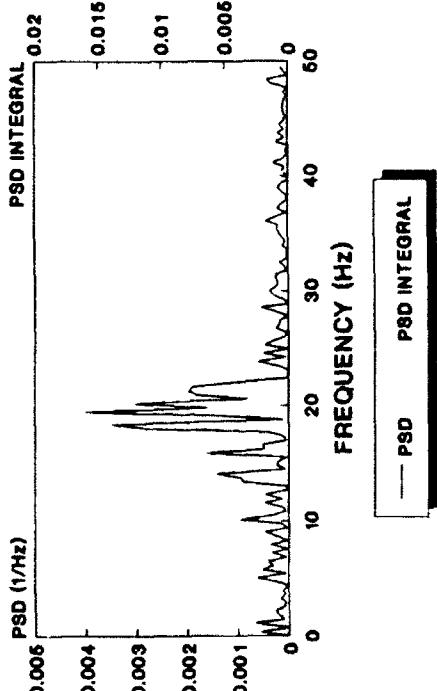
CUBE - HT 8.31 - THETA 46 - AZ 090

**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



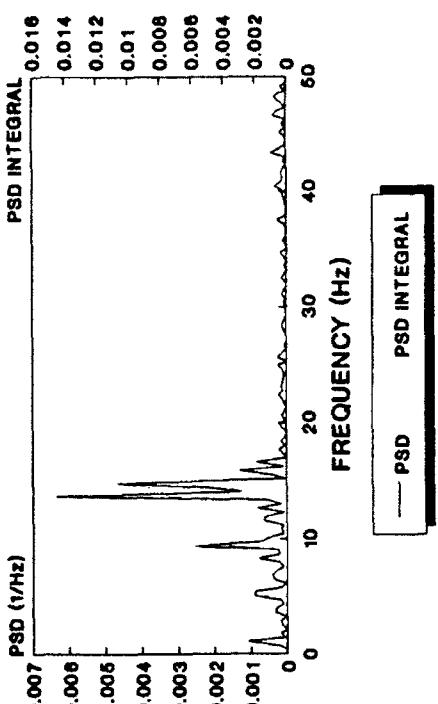
CUBE - HT 8.31 - THETA 45 - AZ 090

**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



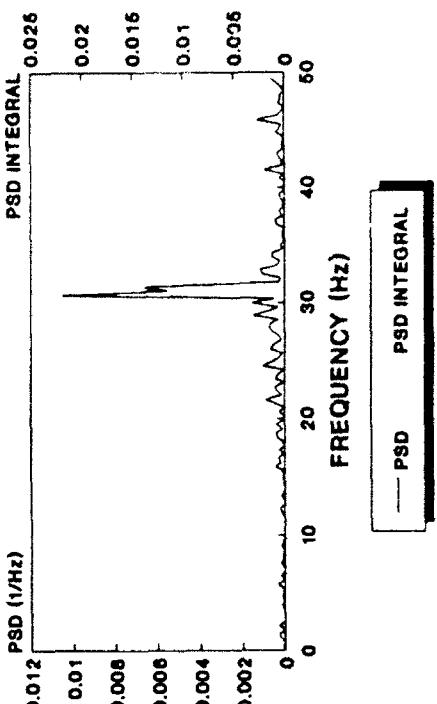
CUBE - HT 8.31 - THETA 45 - AZ 090

**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



CUBE - HT 8.31 - THETA 45 - AZ 090

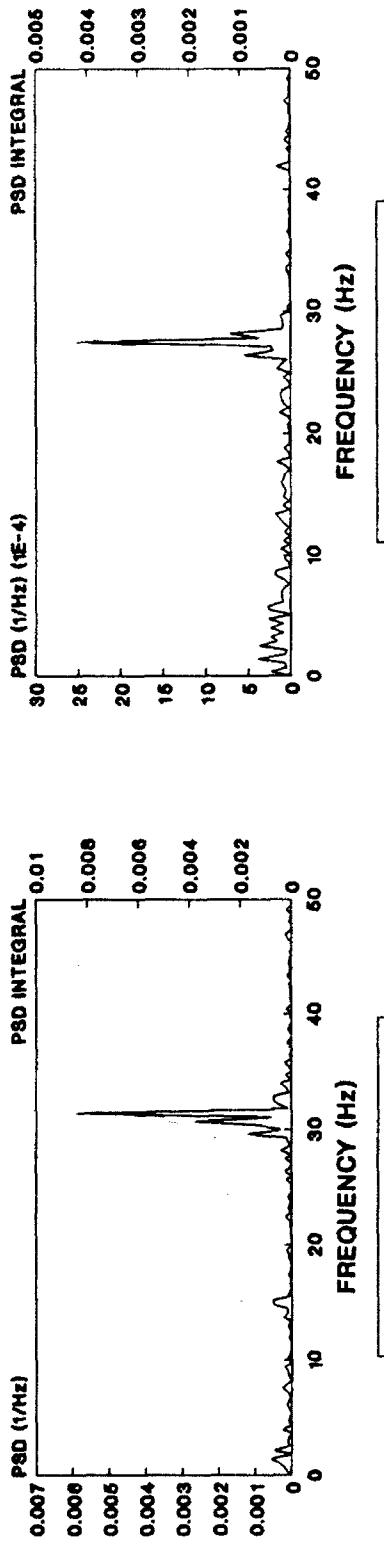
**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



CUBE - HT 8.31 - THETA 45 - AZ 090

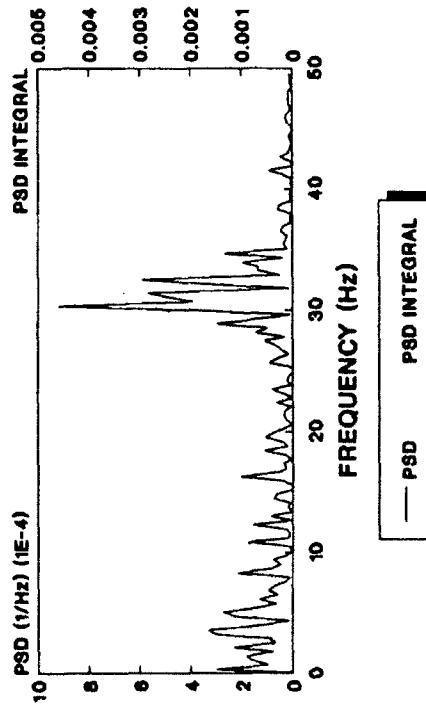
CUBE - HT 8.31 - THETA 45 - AZ 090

FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



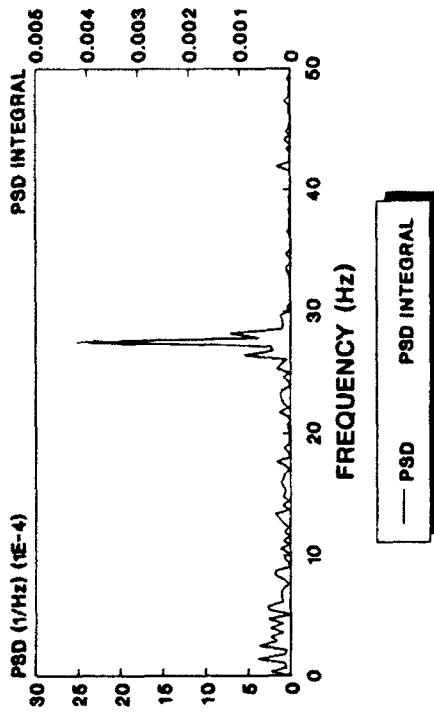
CUBE - HT 0.31 - THETA 46 - AZ 090

FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



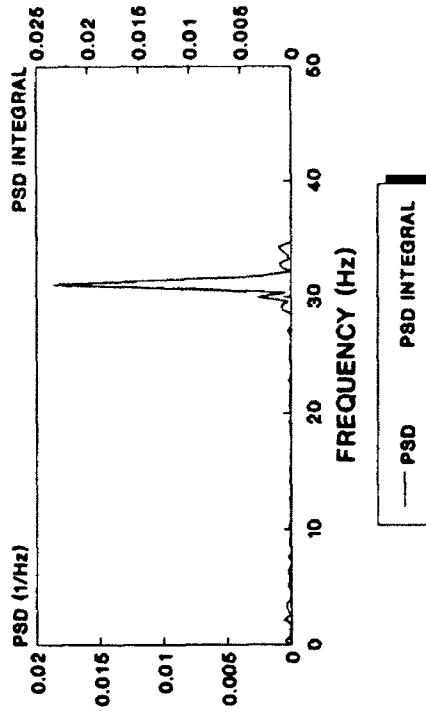
CUBE - HT 0.31 - THETA 46 - AZ 090

FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



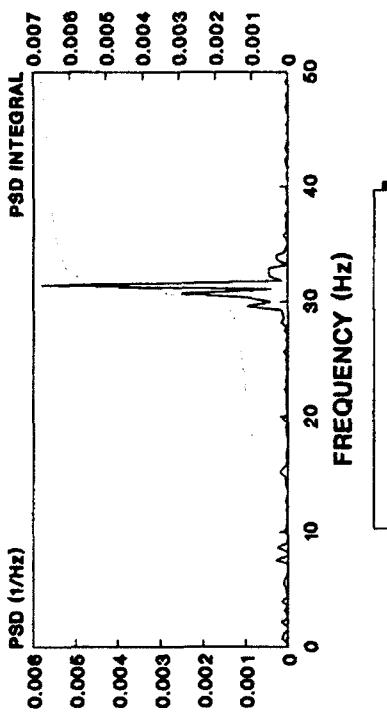
CUBE - HT 0.31 - THETA 46 - AZ 090

FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



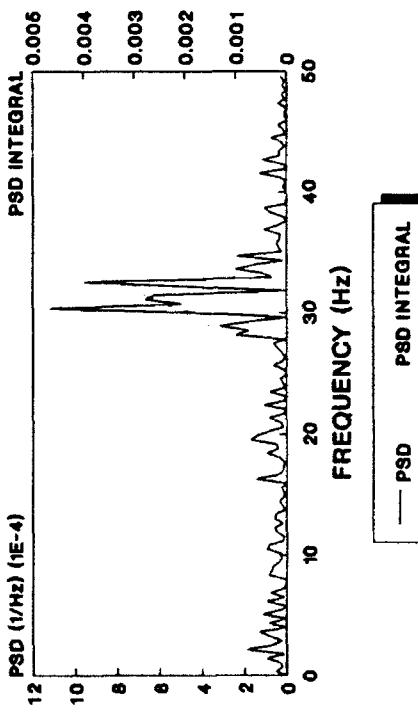
CUBE - HT 0.31 - THETA 46 - AZ 090

MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



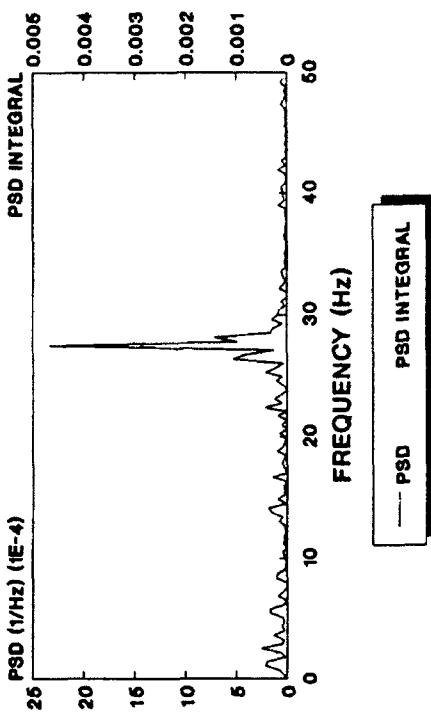
CUBE - HT 6.31 - THETA 45 - AZ 000

MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



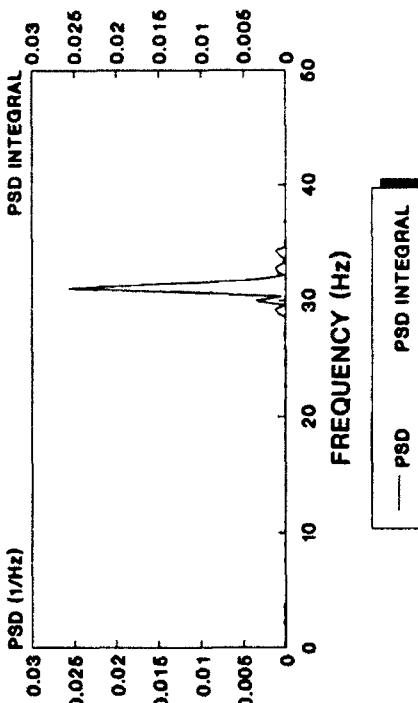
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MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



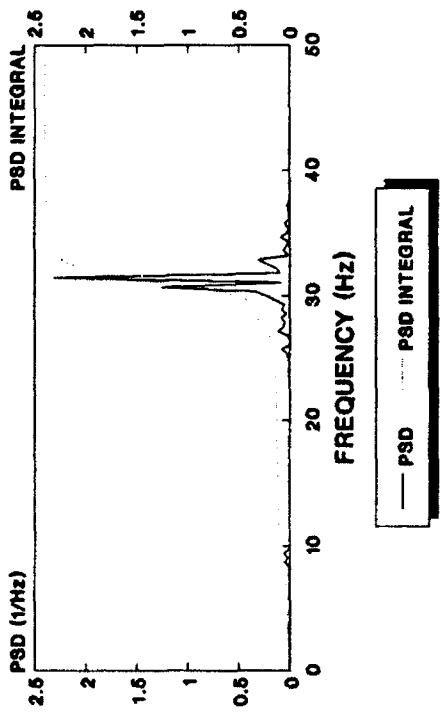
CUBE - HT 6.31 - THETA 45 - AZ 000

MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



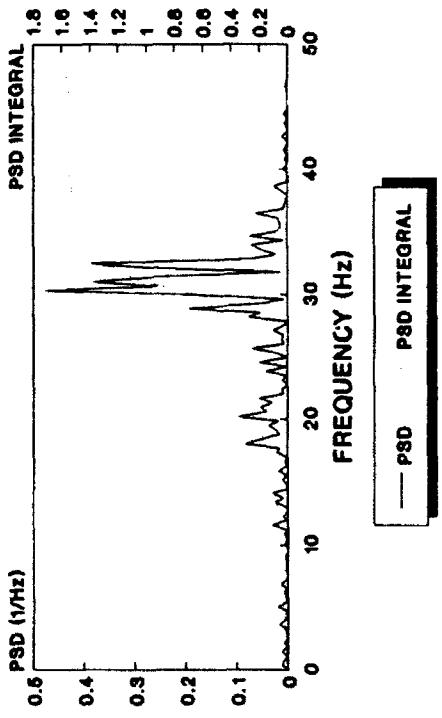
CUBE - HT 6.31 - THETA 45 - AZ 000

MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



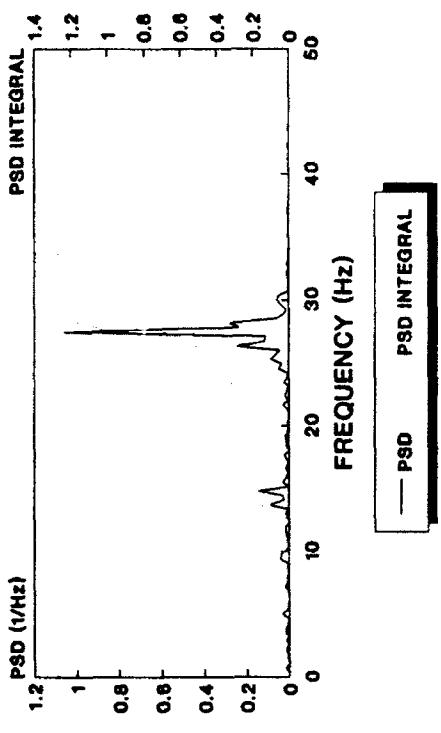
CUBE - HT 6.31 - THETA 46 - AZ 090

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



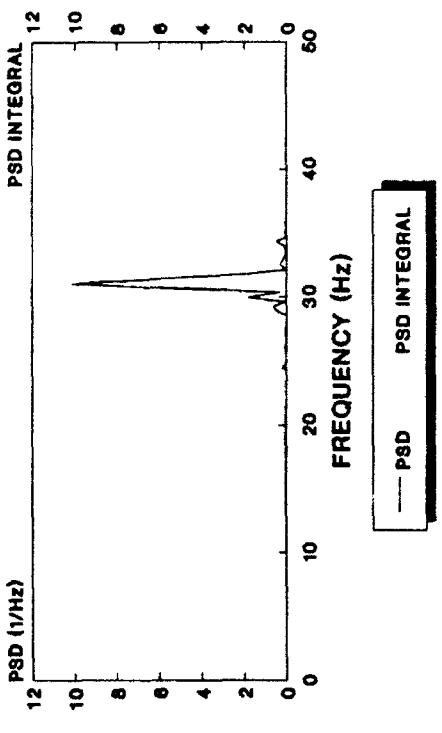
CUBE - HT 6.31 - THETA 46 - AZ 090

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



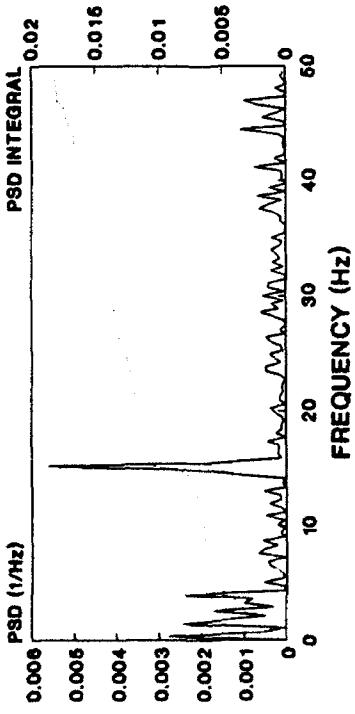
CUBE - HT 6.31 - THETA 46 - AZ 090

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

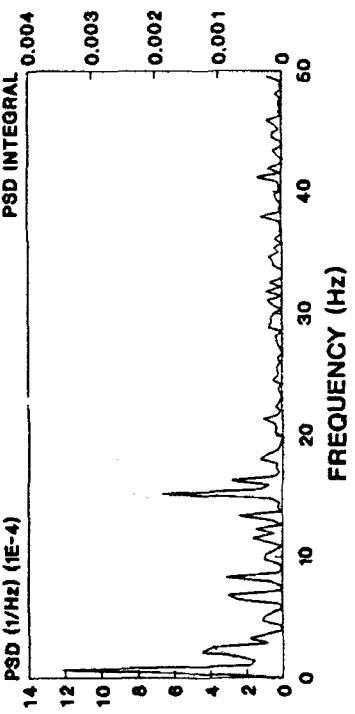


CUBE - HT 6.31 - THETA 46 - AZ 090

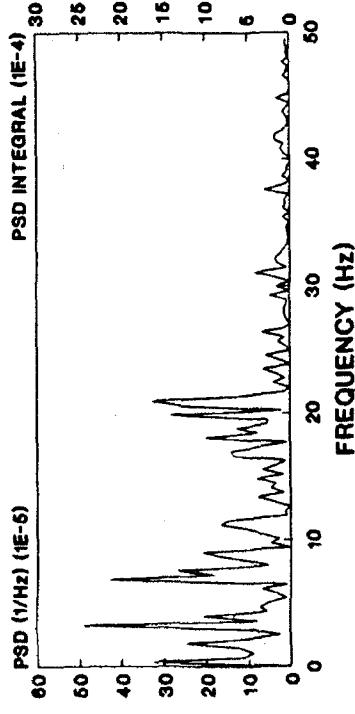
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



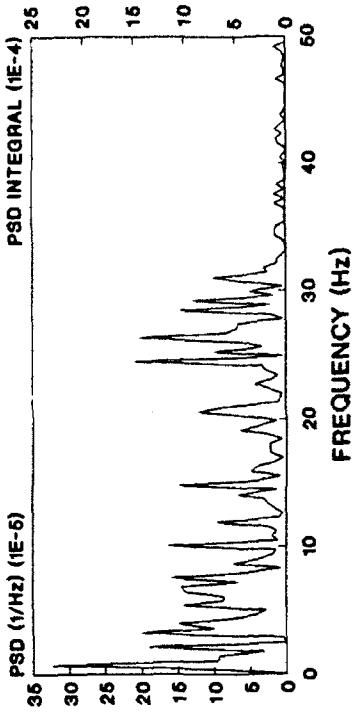
FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



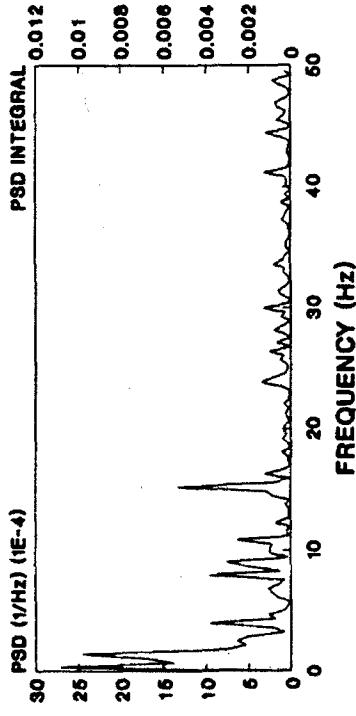
FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



FORCE COEFF - NORMAL 180 FT/SEC NOMINAL

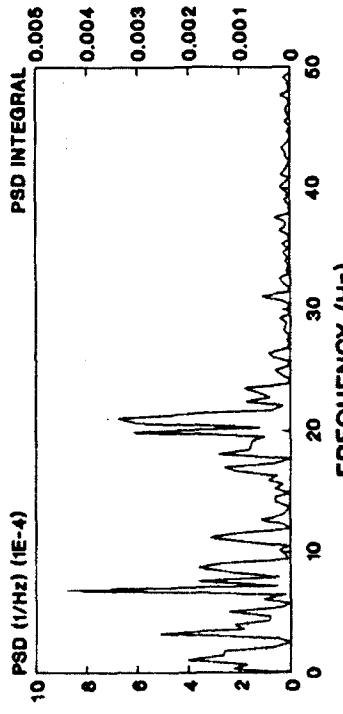


**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



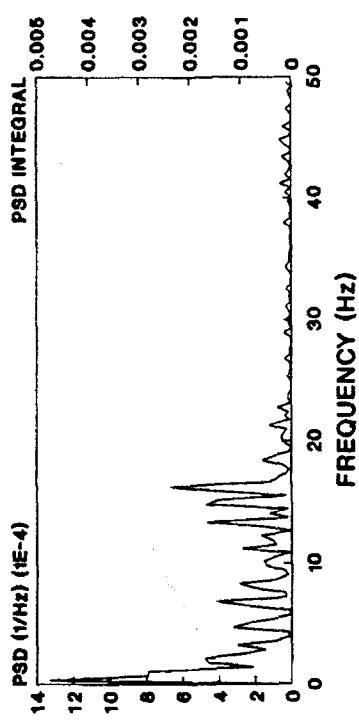
CUBE - HT 6.31 - THETA 45 - AZ 120

**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



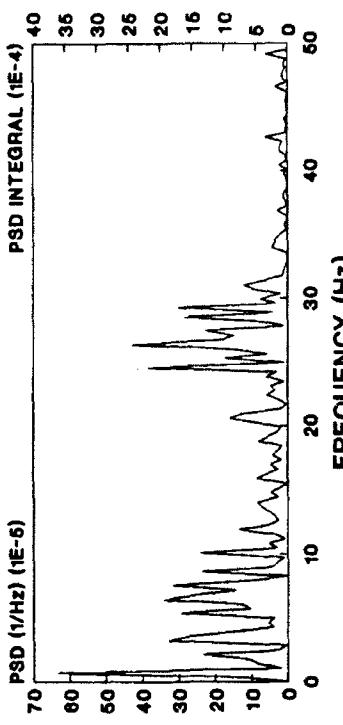
CUBE - HT 6.31 - THETA 45 - AZ 120

**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



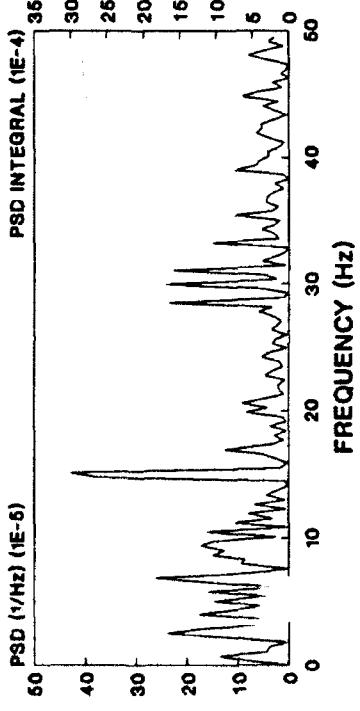
CUBE - HT 6.31 - THETA 45 - AZ 120

**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



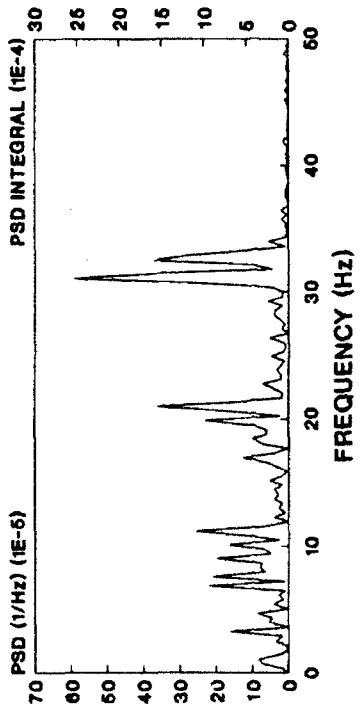
CUBE - HT 6.31 - THETA 45 - AZ 120

FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



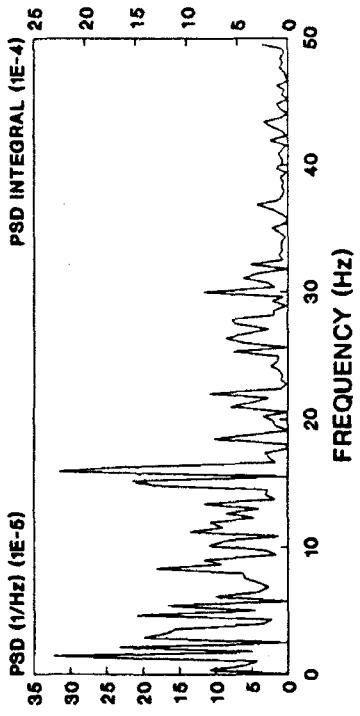
CUBE - HT 8.31 - THETA 45 - AZ 120

FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



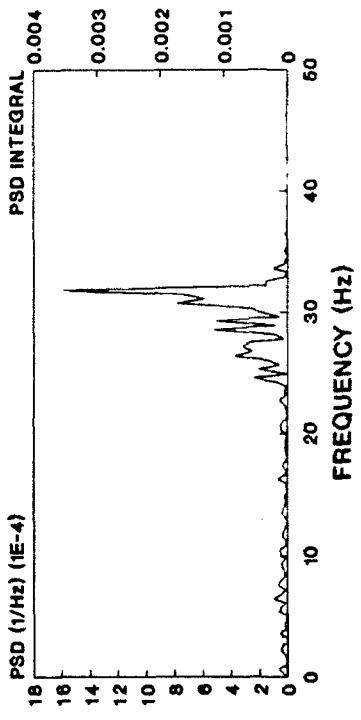
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FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



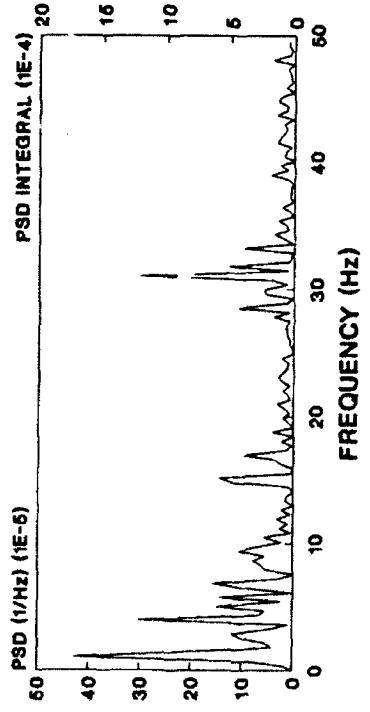
CUBE - HT 8.31 - THETA 45 - AZ 120

FORCE COEFF - LATERAL 180 FT/SEC NOMINAL

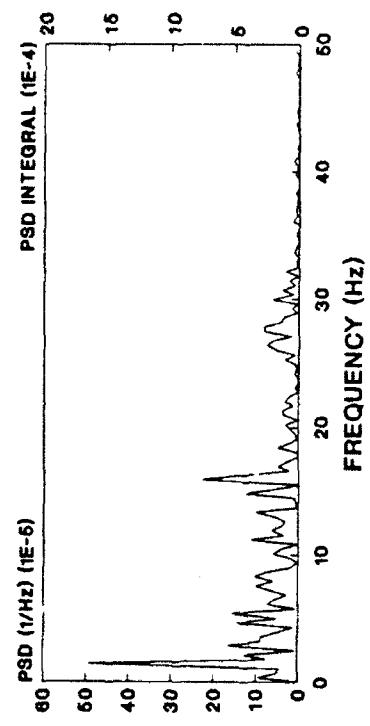


CUBE - HT 8.31 - THETA 45 - AZ 120

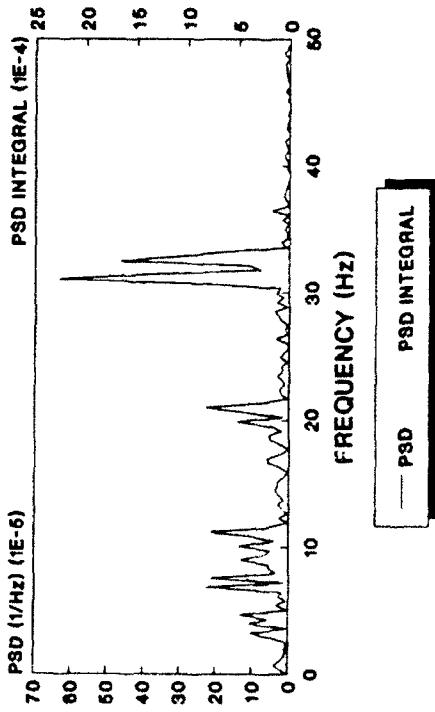
**MOMENT COEFF - LATERAL
60 FT/SEC NOMINAL**



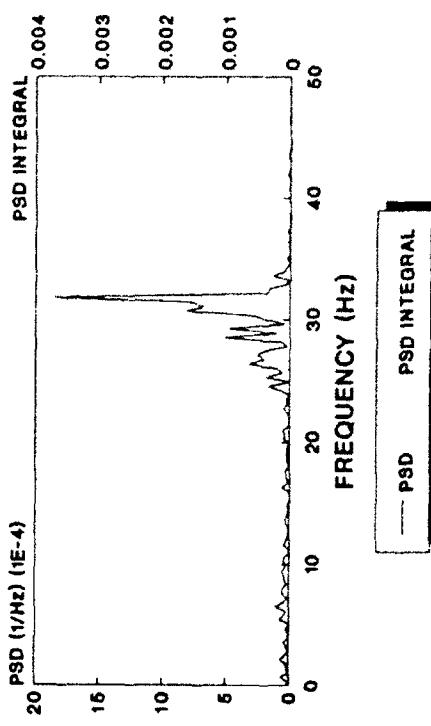
**MOMENT COEFF - LATERAL
90 FT/SEC NOMINAL**



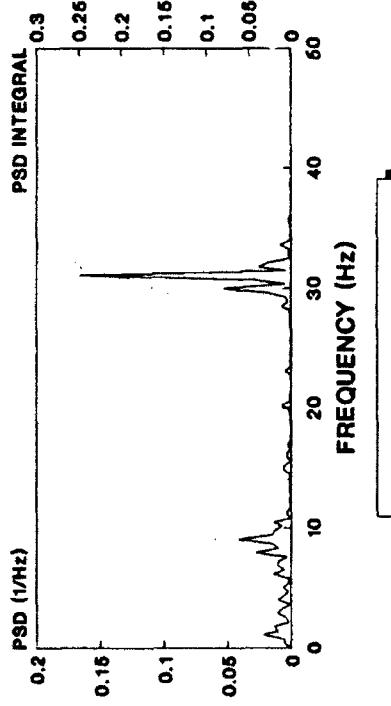
**MOMENT COEFF - LATERAL
120 FT/SEC NOMINAL**



**MOMENT COEFF - LATERAL
180 FT/SEC NOMINAL**

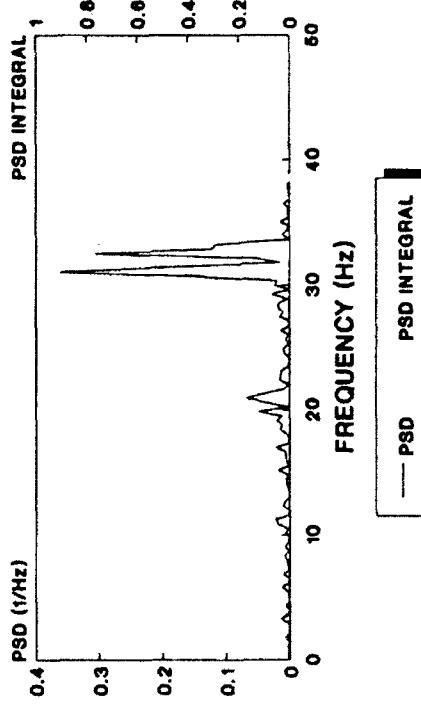


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



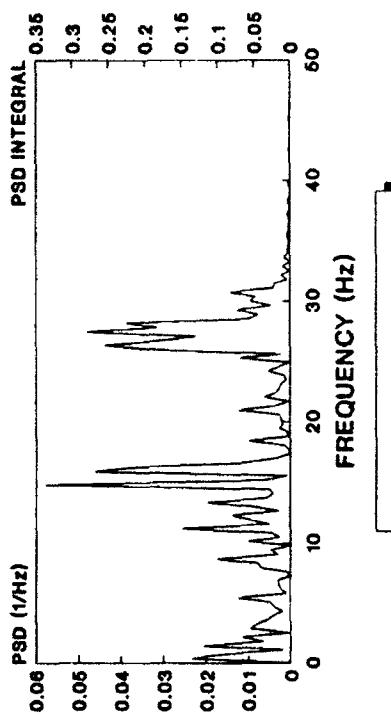
CUBE - HT 6.31 - THETA 46 - AZ 120

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



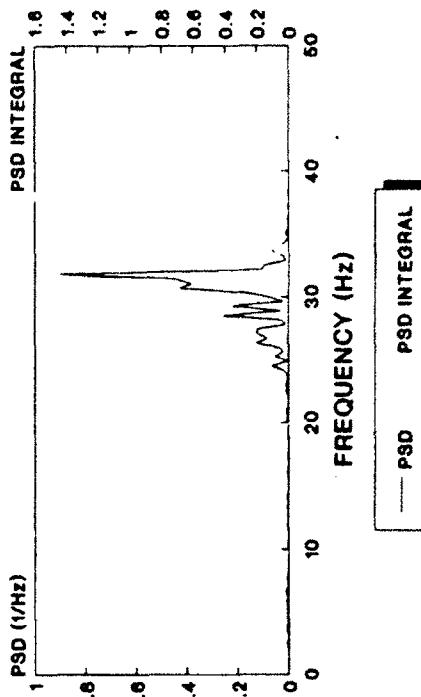
CUBE - HT 6.31 - THETA 46 - AZ 120

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



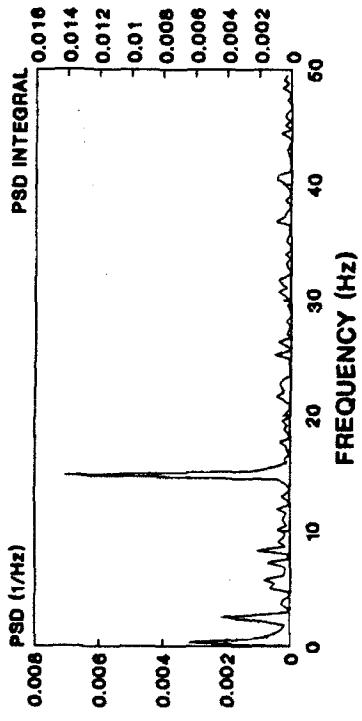
CUBE - HT 6.31 - THETA 46 - AZ 120

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

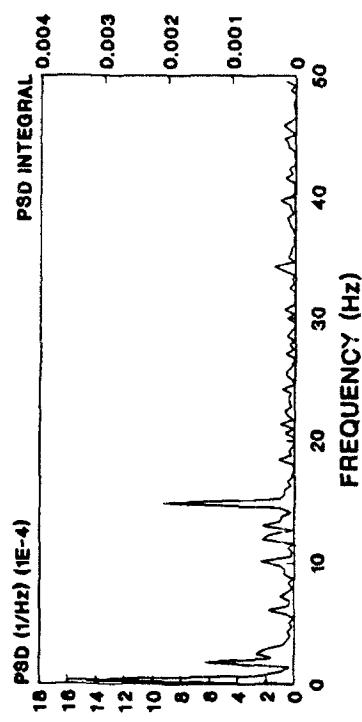


CUBE - HT 6.31 - THETA 46 - AZ 120

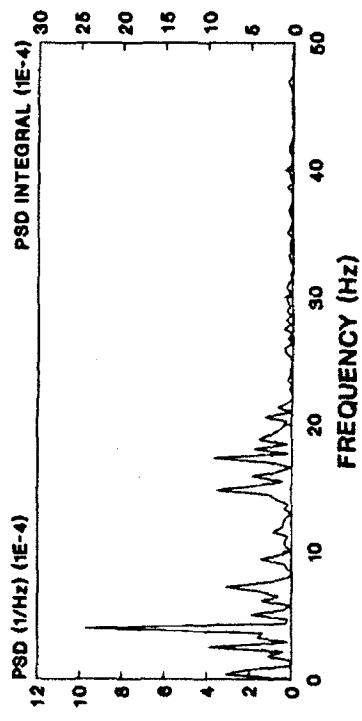
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



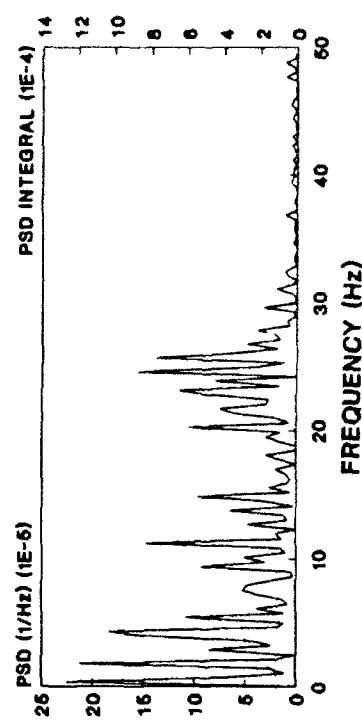
FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



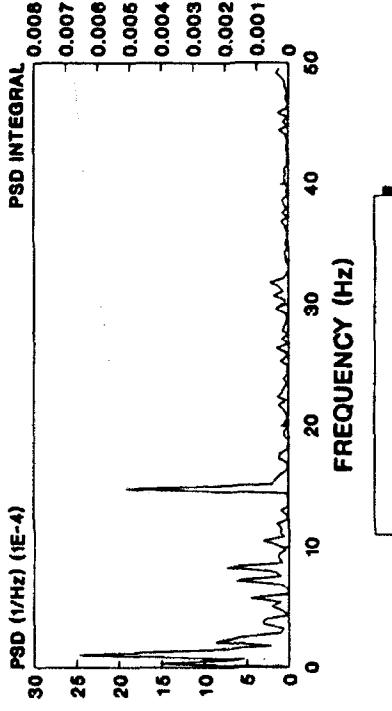
FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



FORCE COEFF - NORMAL 180 FT/SEC NOMINAL

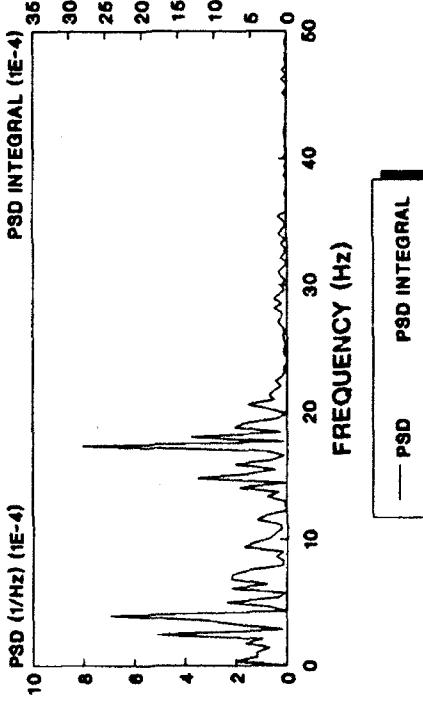


MOMENT COEFF - NORMAL 60 FT/SEC NOMINAL



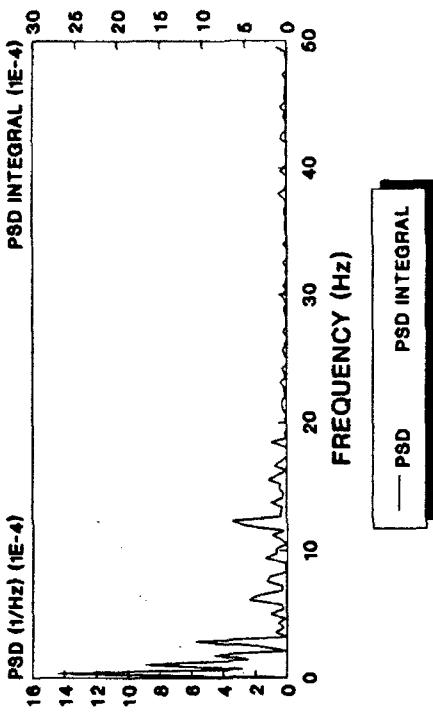
CUBE - HT 8.31 - THETA 46 - AZ 136

MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



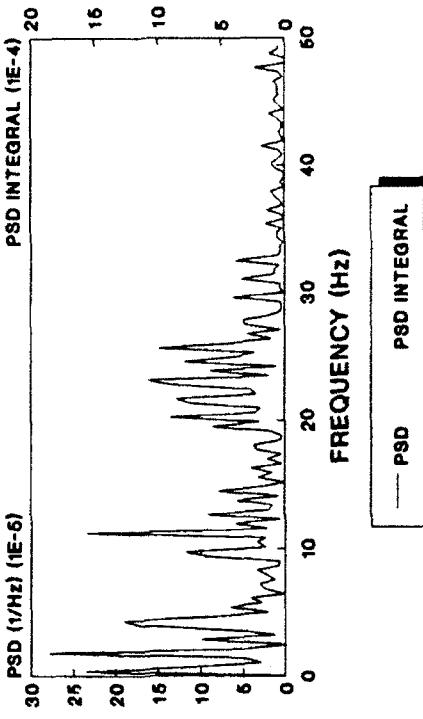
CUBE - HT 8.31 - THETA 46 - AZ 136

MOMENT COEFF - NORMAL 90 FT/SEC NOMINAL



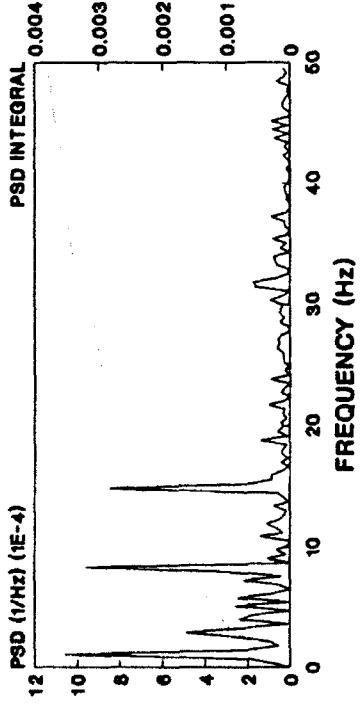
CUBE - HT 8.31 - THETA 46 - AZ 136

MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL



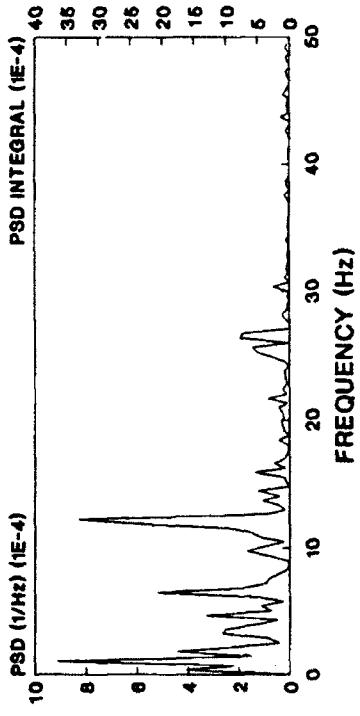
CUBE - HT 8.31 - THETA 46 - AZ 136

FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



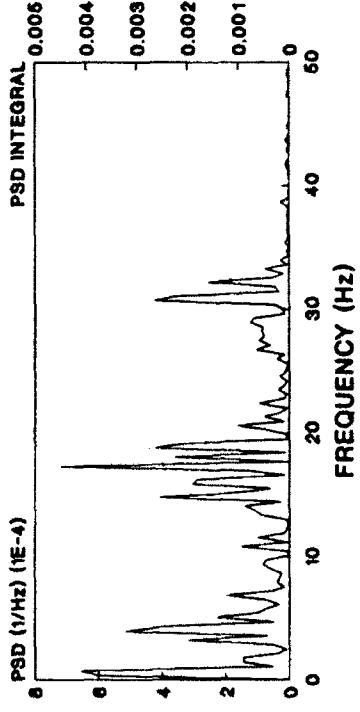
CUBE - HT 0.31 - THETA 46 - AZ 136

FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



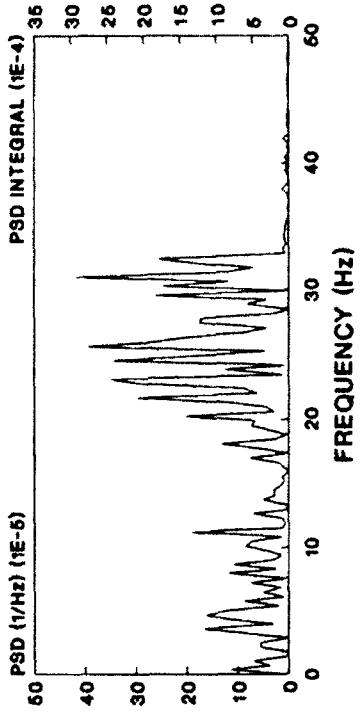
CUBE - HT 0.31 - THETA 46 - AZ 136

FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



CUBE - HT 0.31 - THETA 46 - AZ 136

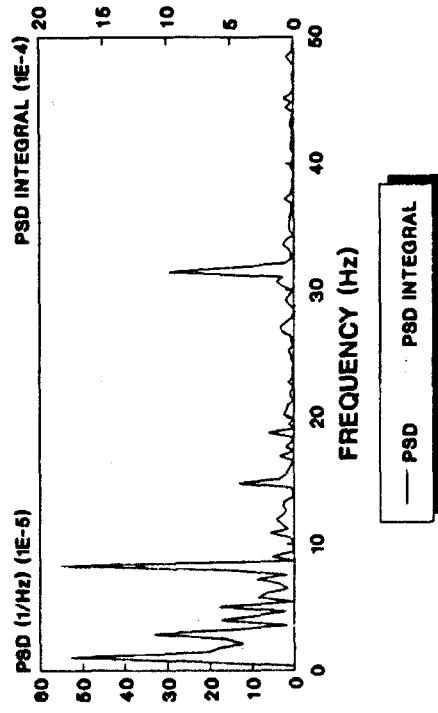
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



CUBE - HT 0.31 - THETA 46 - AZ 136

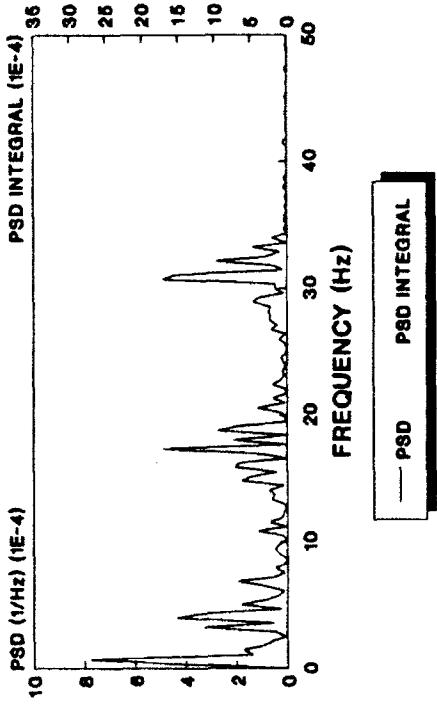
CUBE - HT 0.31 - THETA 46 - AZ 136

MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



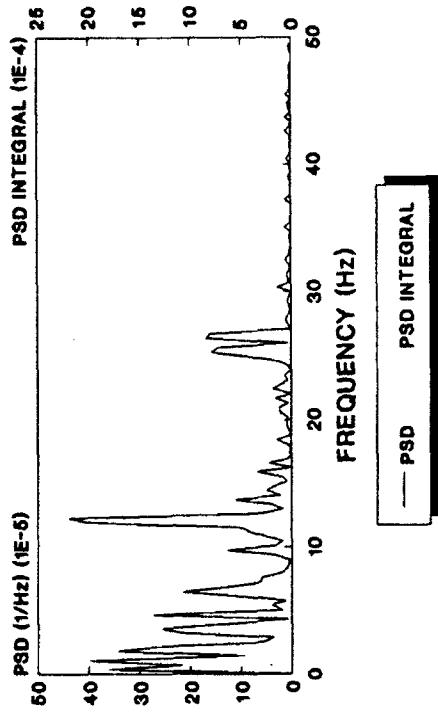
CUBE - HT 8.31 - THETA 45 - AZ 136

MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



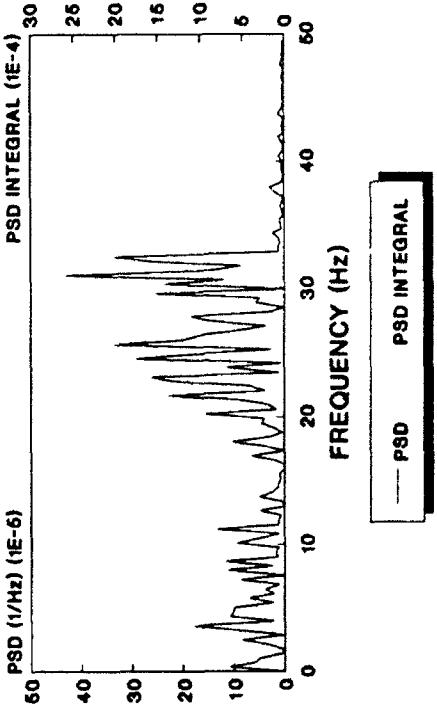
CUBE - HT 8.31 - THETA 45 - AZ 136

MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



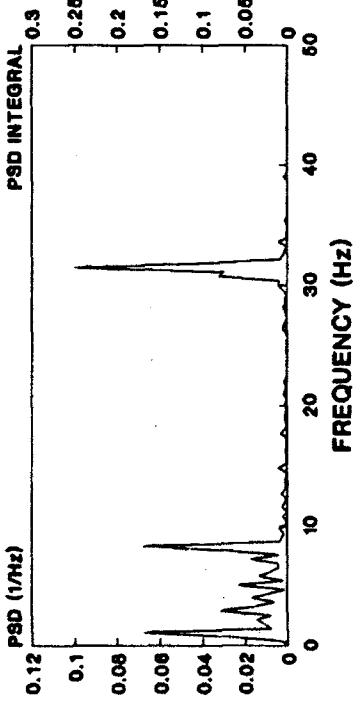
CUBE - HT 8.31 - THETA 45 - AZ 136

MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



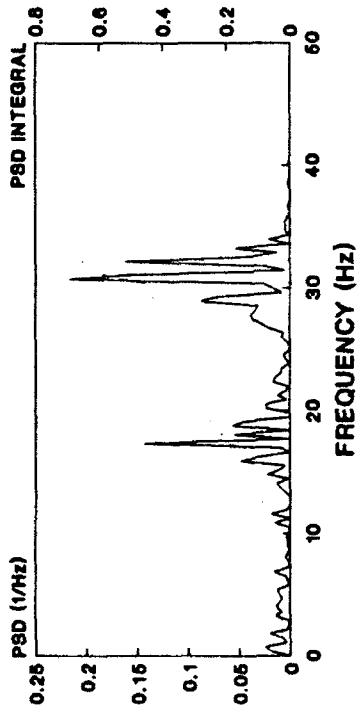
CUBE - HT 8.31 - THETA 45 - AZ 136

MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



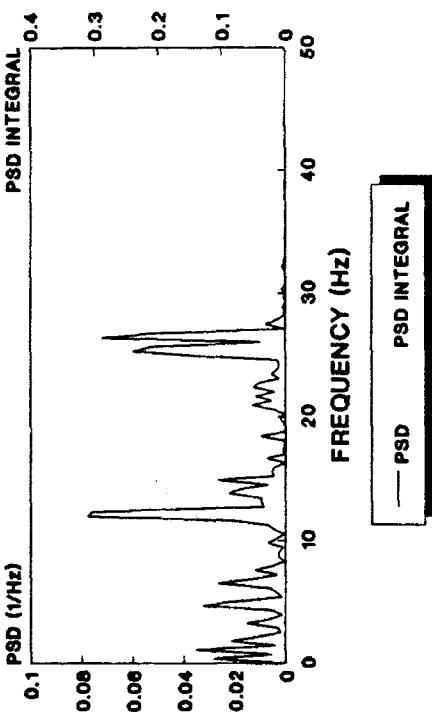
CUBE - HT 8.31 - THETA 45 - AZ 135

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



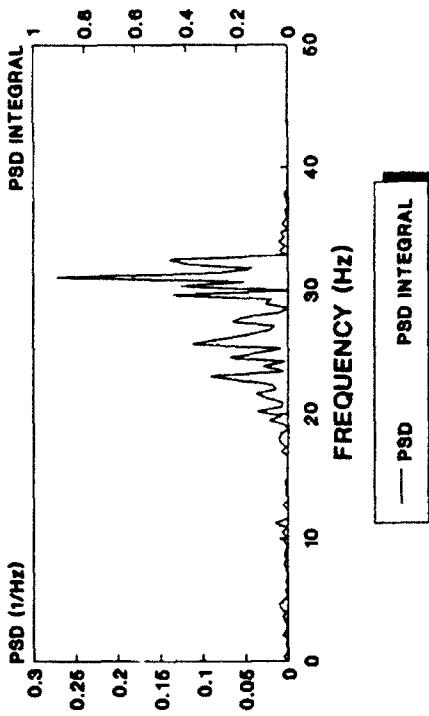
CUBE - HT 8.31 - THETA 45 - AZ 135

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



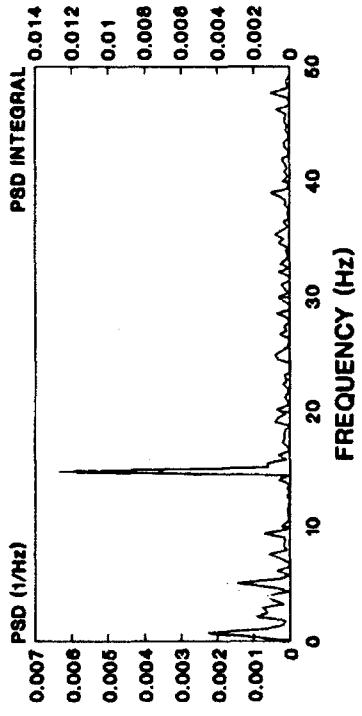
CUBE - HT 8.31 - THETA 45 - AZ 135

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

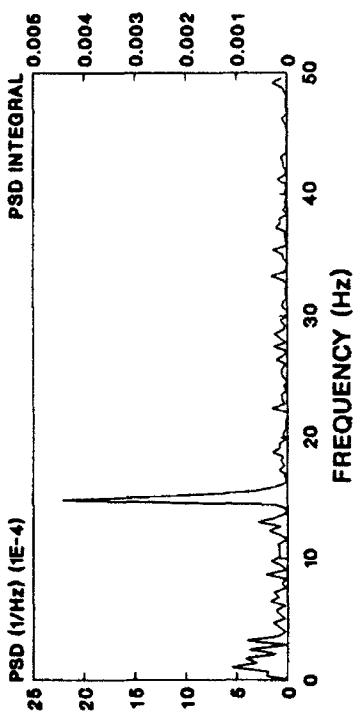


CUBE - HT 8.31 - THETA 45 - AZ 135

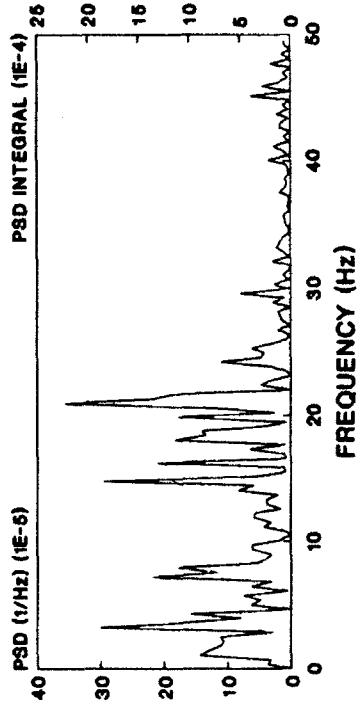
**FORCE COEFF - NORMAL
60 FT/SEC NOMINAL**



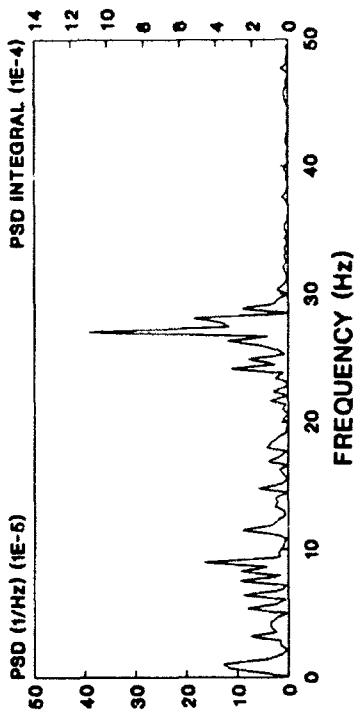
**FORCE COEFF - NORMAL
90 FT/SEC NOMINAL**



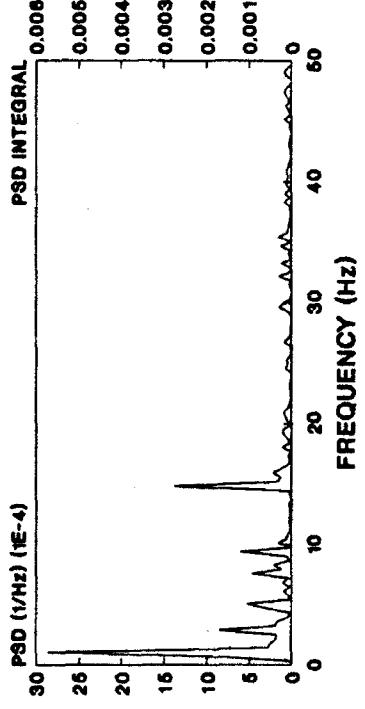
**FORCE COEFF - NORMAL
120 FT/SEC NOMINAL**



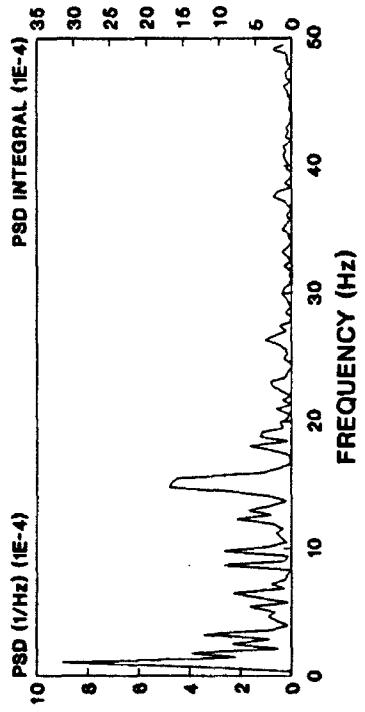
**FORCE COEFF - NORMAL
180 FT/SEC NOMINAL**



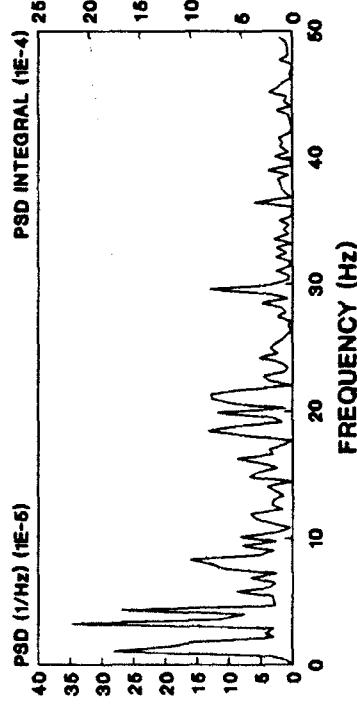
**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



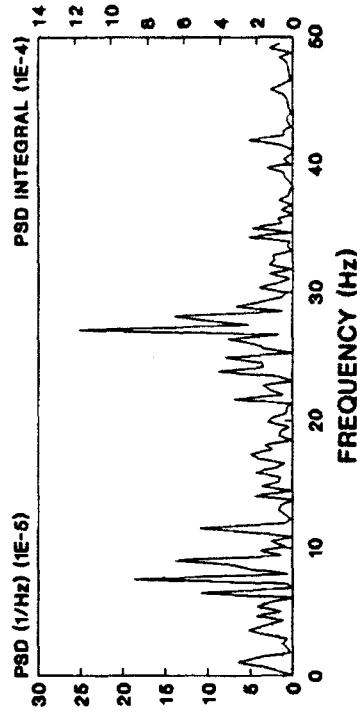
**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



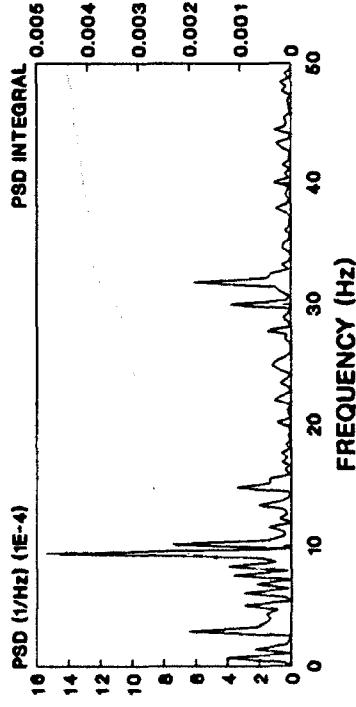
**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



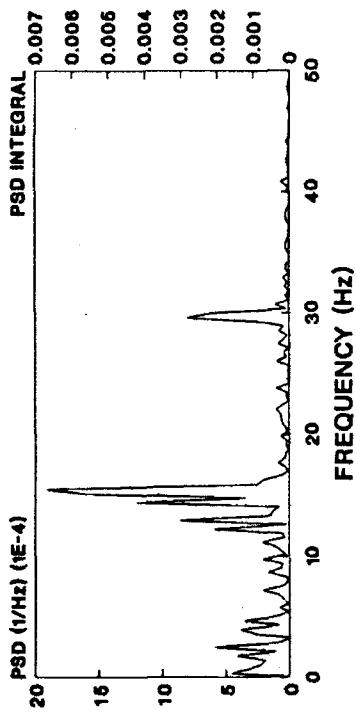
**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



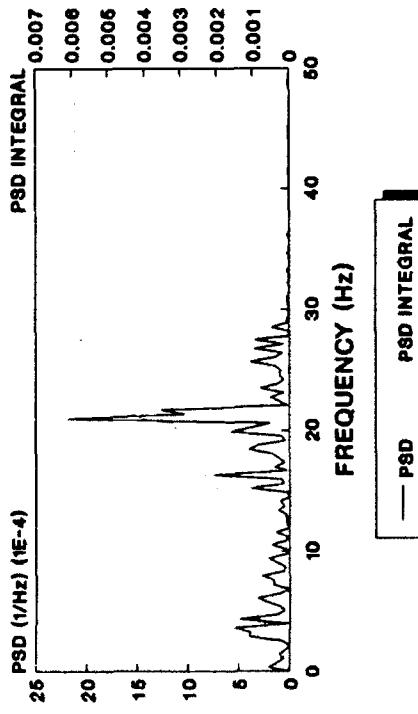
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



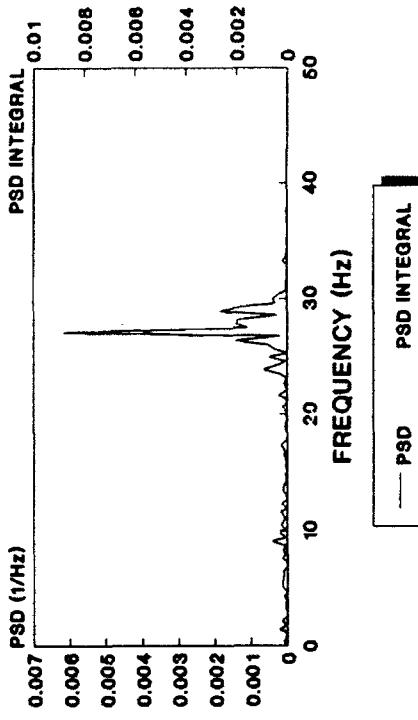
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



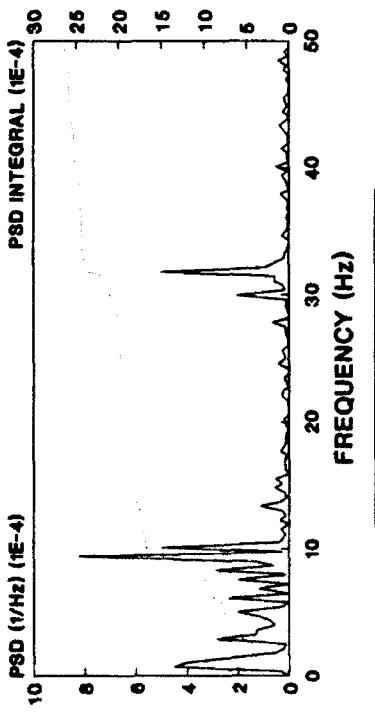
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



FORCE COEFF - LATERAL 180 FT/SEC NOMINAL

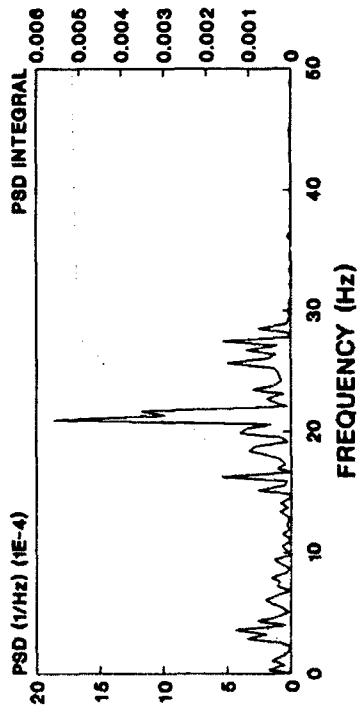


MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



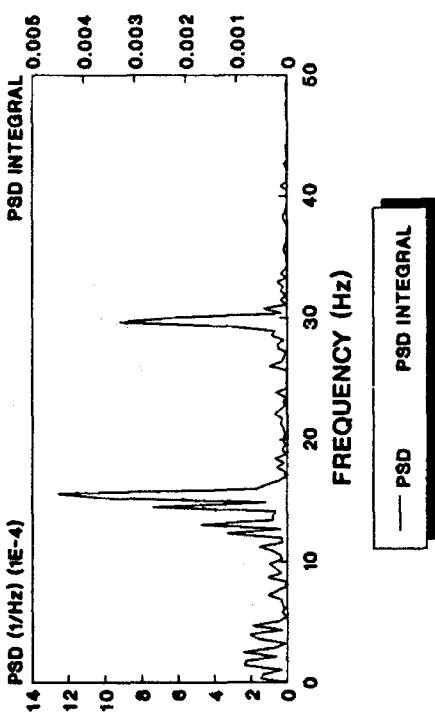
CUBE - HT 6.31 - THETA 46 - AZ 160

MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



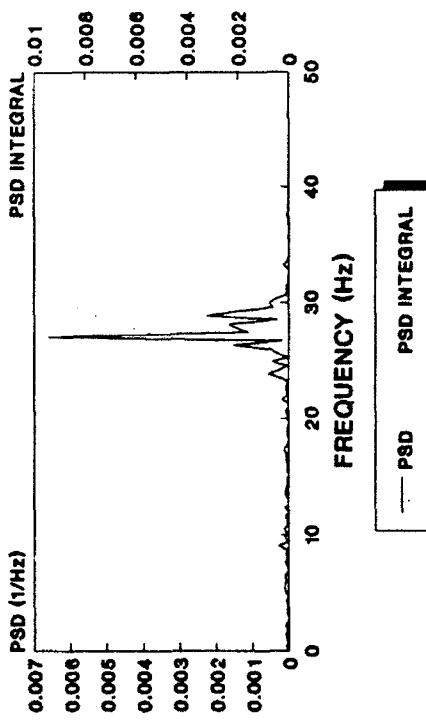
CUBE - HT 6.31 - THETA 46 - AZ 160

MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



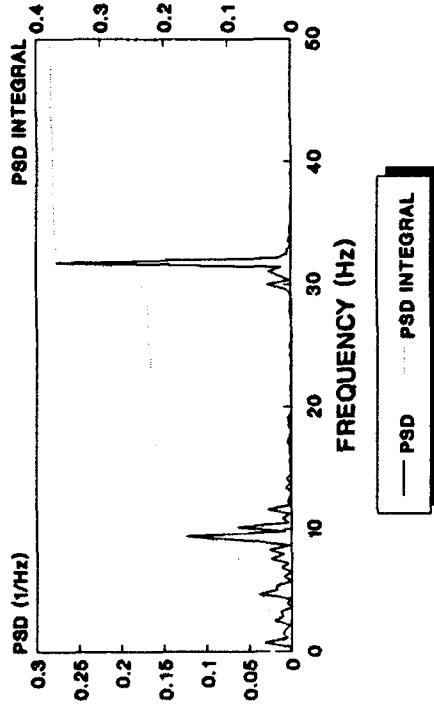
CUBE - HT 6.31 - THETA 46 - AZ 160

MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



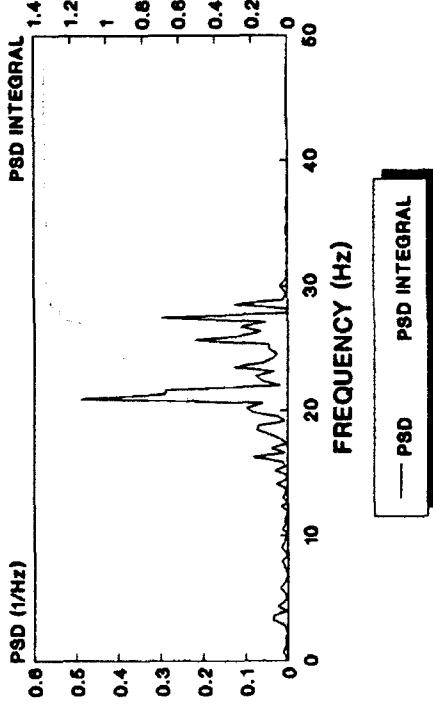
CUBE - HT 6.31 - THETA 46 - AZ 160

MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



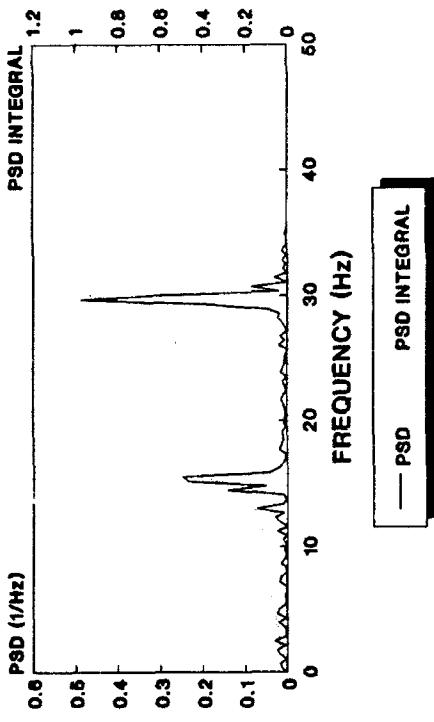
CUBE - HT 0.31 - THETA 45 - AZ 180

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



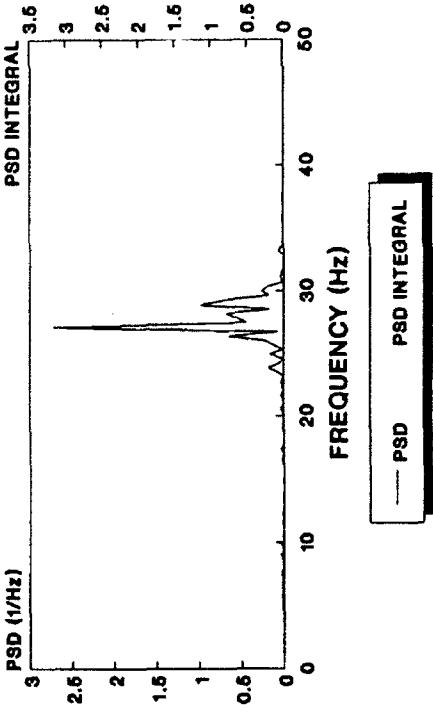
CUBE - HT 0.31 - THETA 45 - AZ 180

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



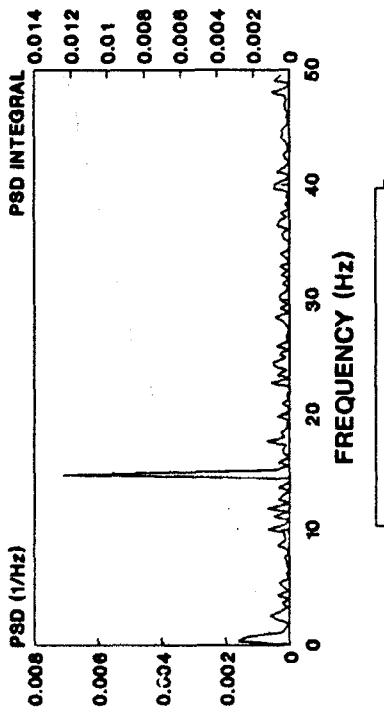
CUBE - HT 0.31 - THETA 45 - AZ 180

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

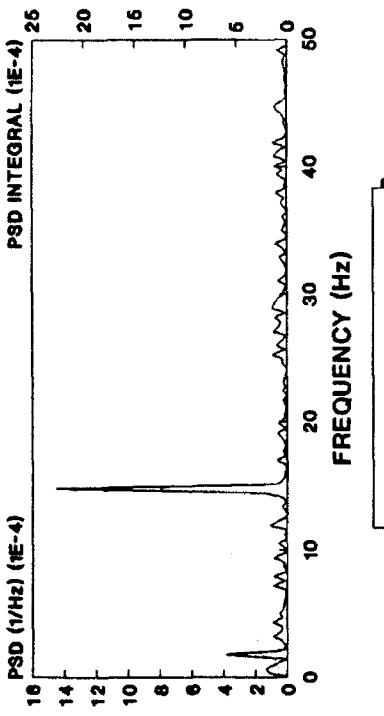


CUBE - HT 0.31 - THETA 45 - AZ 180

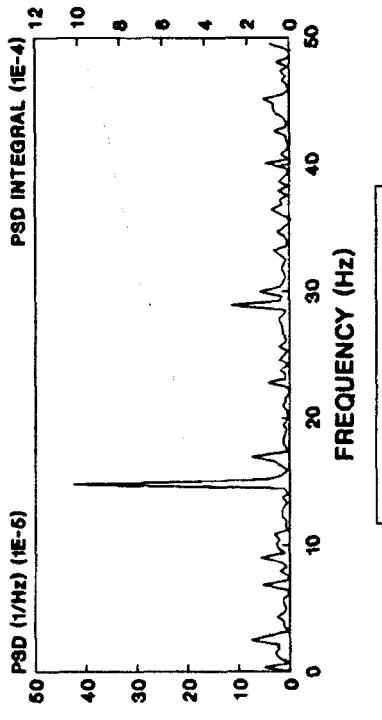
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



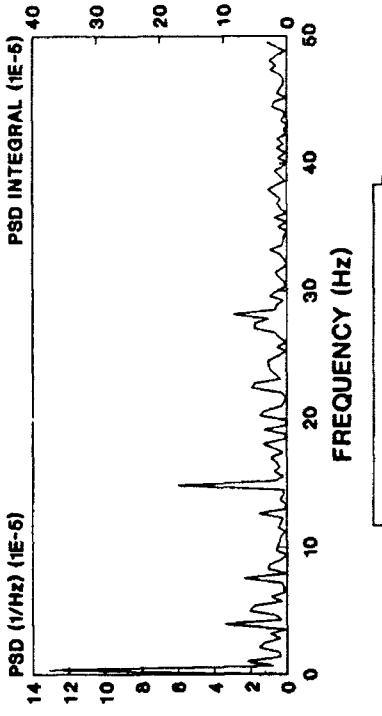
FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



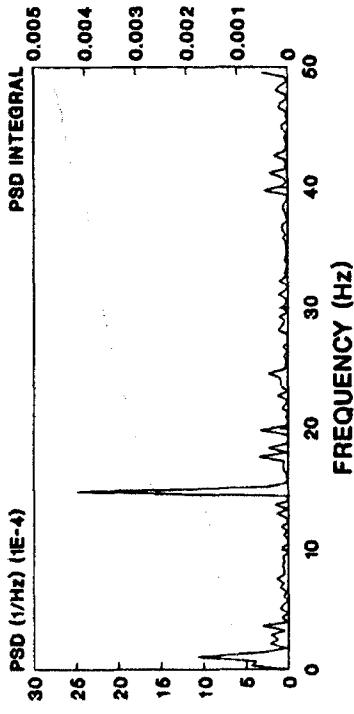
FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



FORCE COEFF - NORMAL 180 FT/SEC NOMINAL

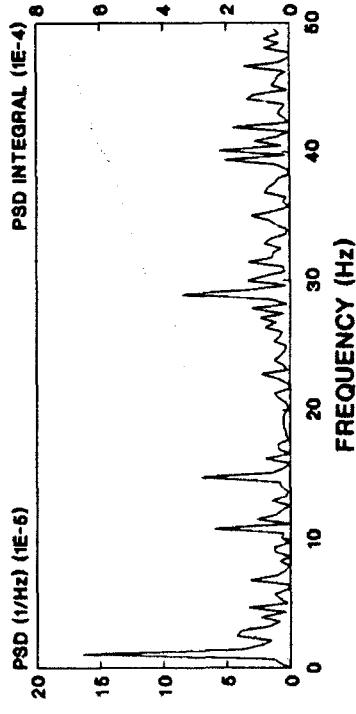


MOMENT COEFF - NORMAL 60 FT/SEC NOMINAL



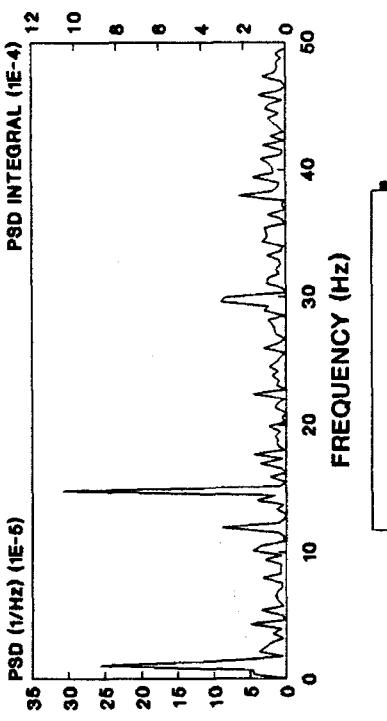
CUBE - HT 8.31 - THETA 45 - AZ 180

MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



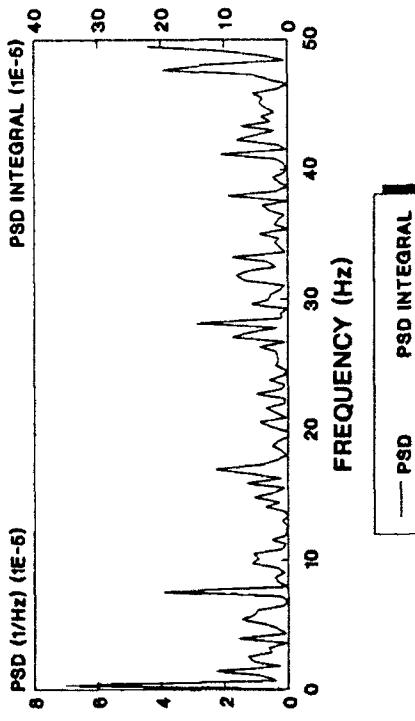
CUBE - HT 8.31 - THETA 45 - AZ 180

MOMENT COEFF - NORMAL 90 FT/SEC NOMINAL



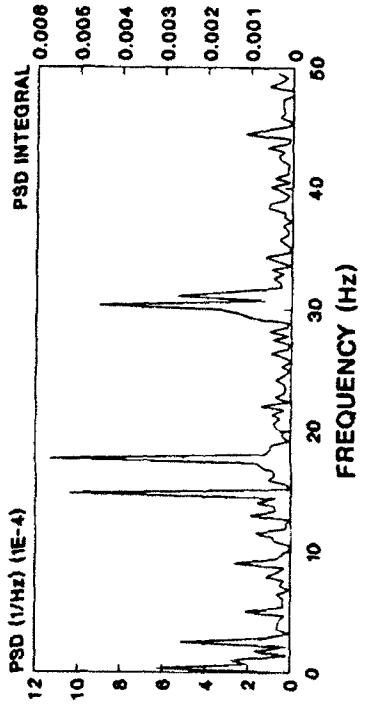
CUBE - HT 8.31 - THETA 45 - AZ 180

MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL

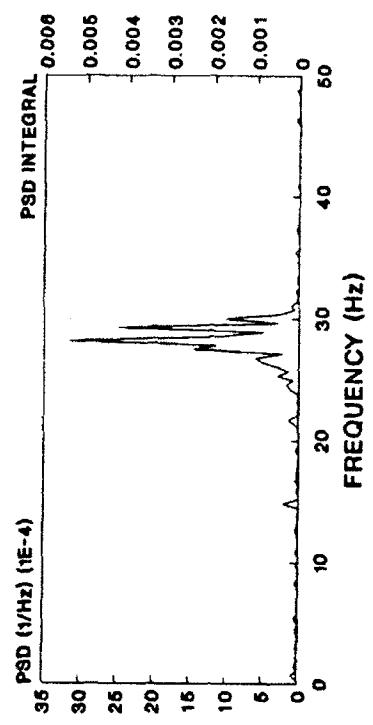


CUBE - HT 8.31 - THETA 45 - AZ 180

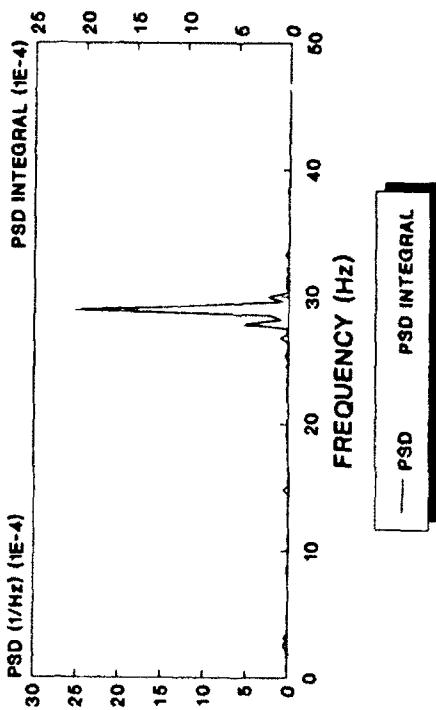
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



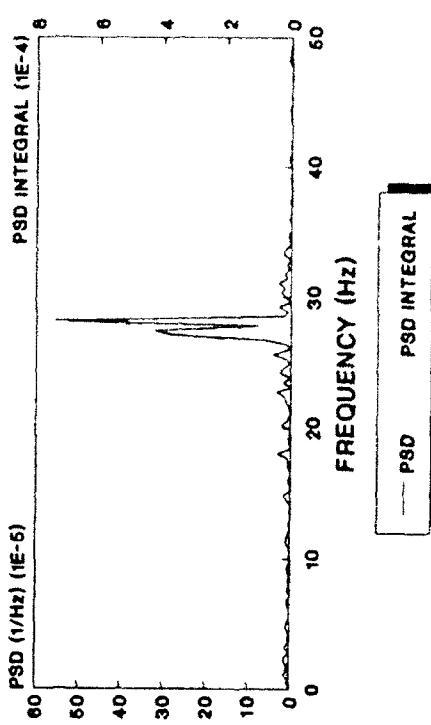
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



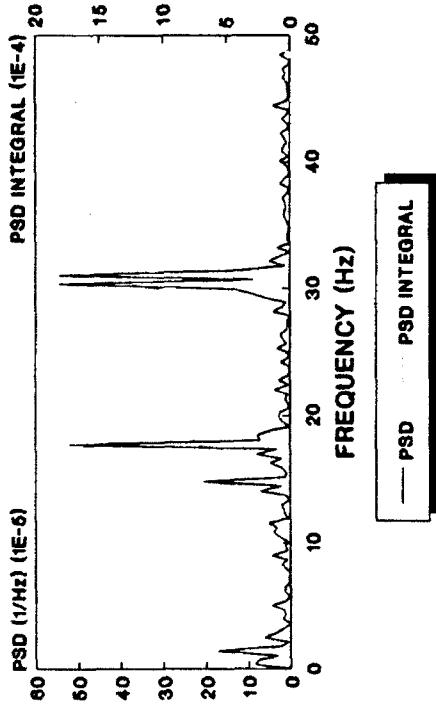
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



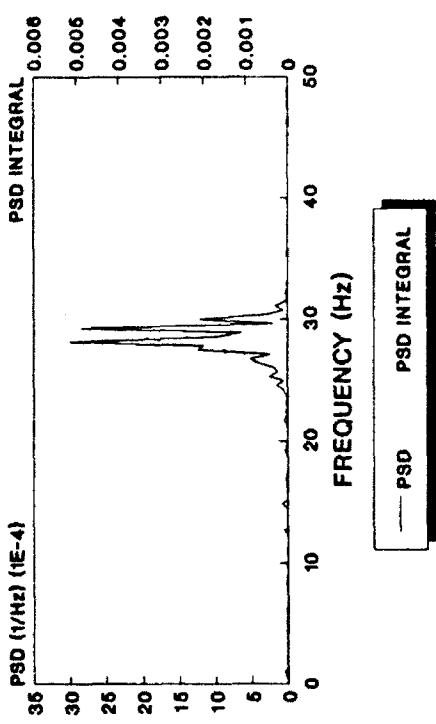
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



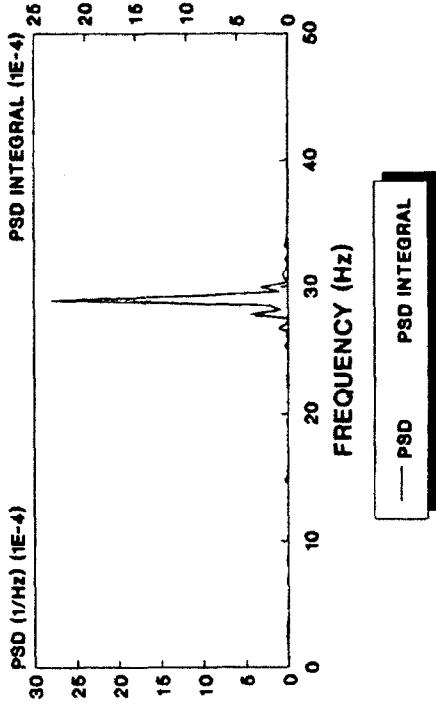
MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



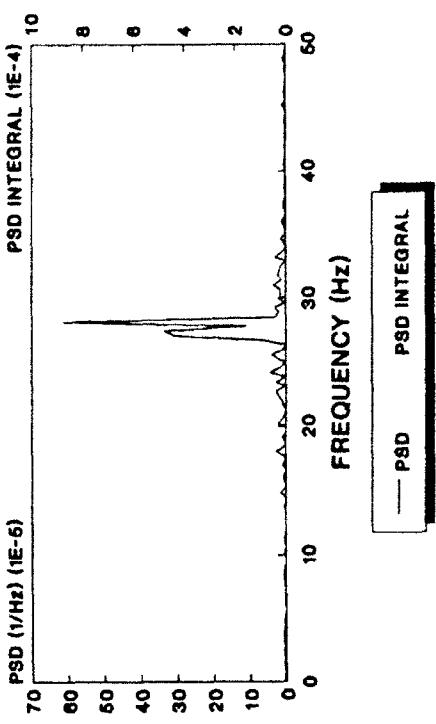
MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



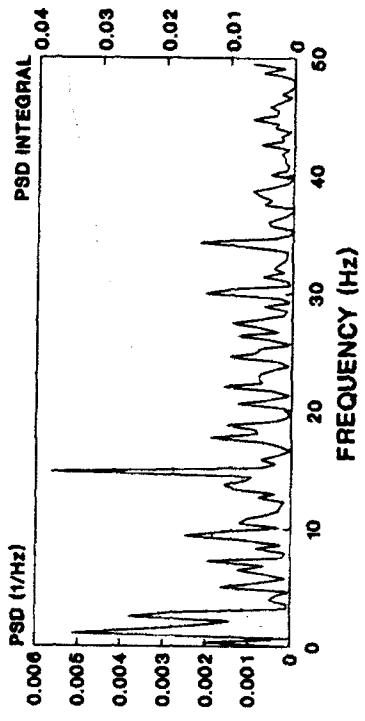
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL

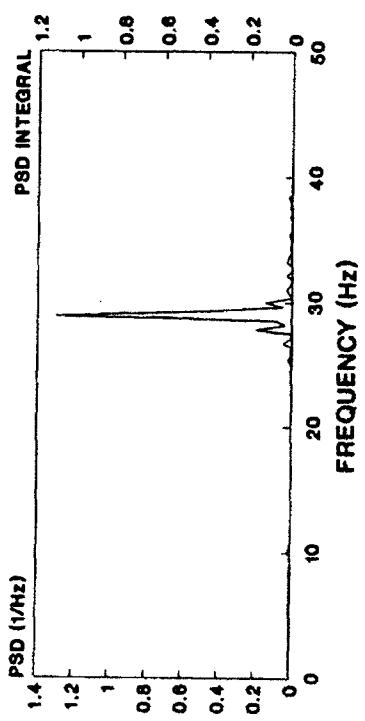


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



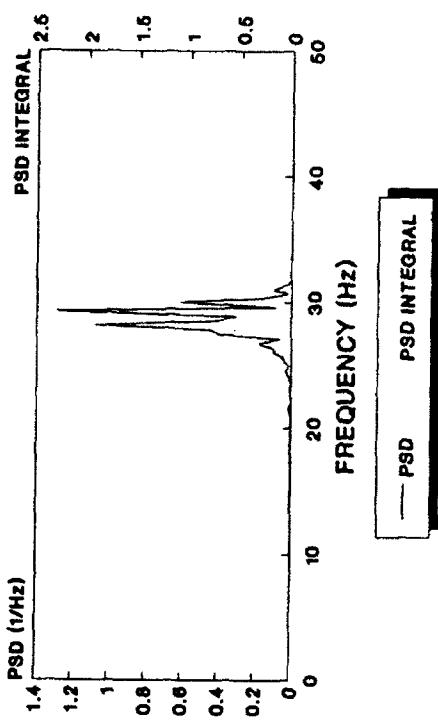
CUBE - HT 8.31 - THETA 46 - AZ 180

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



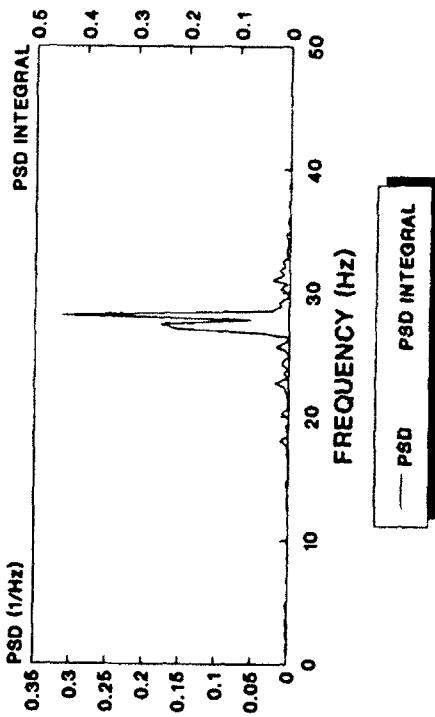
CUBE - HT 8.31 - THETA 46 - AZ 180

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



CUBE - HT 8.31 - THETA 46 - AZ 180

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



CUBE - HT 8.31 - THETA 46 - AZ 180

DATA REPORT

SHAPE:	CUBE (ROUNDED)
DECLINATION [THETA (degrees)]:	0
DIMENSIONS [LxWxH (in)]:	8.0 x 8.0 x 10.0
WEIGHT (gm):	1700.0
TORSION FREQUENCY (Hz):	34
LATERAL (SIDE BEND) FREQUENCY (Hz):	46
NORMAL (AFT BEND) FREQUENCY (Hz):	46
AZIMUTHS (degrees):	0, 30, 45, 60, 90

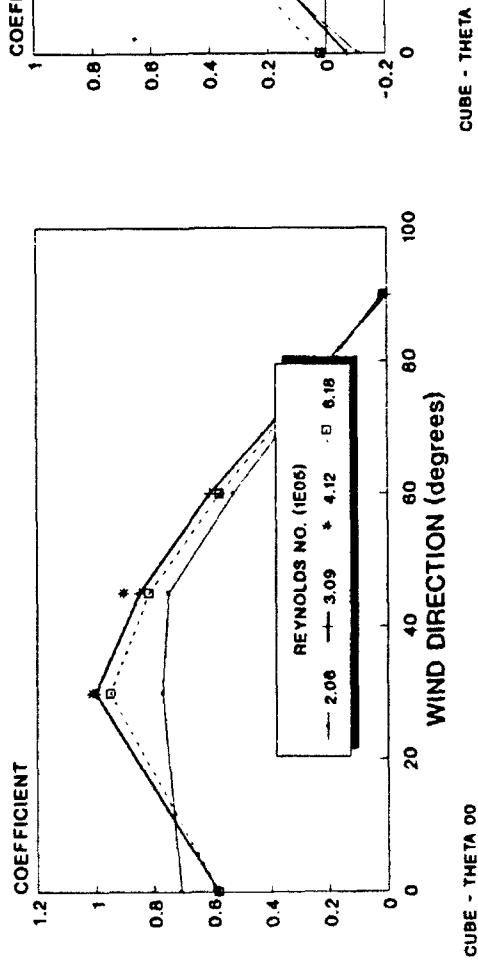
GRAPH CORRECTIONS:

- The mean value of the **ROLL** moment coefficients should be divided by 12.
- The PSD and PSD Integral values of the **ROLL** moment coefficients should be divided by 144.

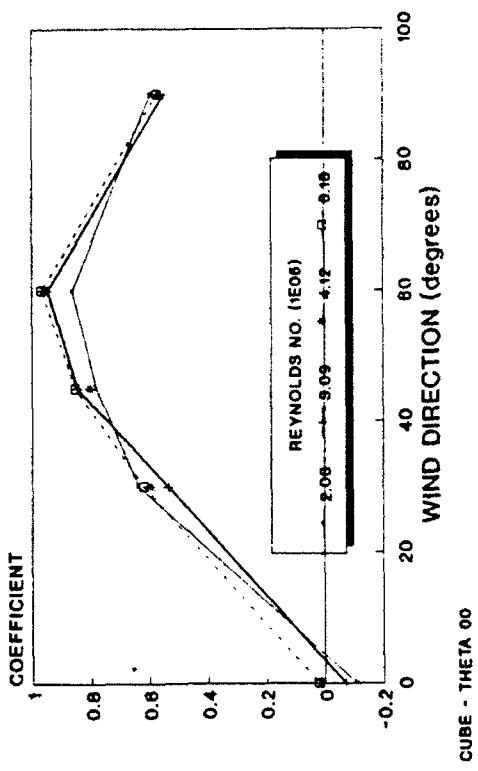
OBSERVATIONS:

- Shedding not observed.
- 15.176 Hz spike seen in data.

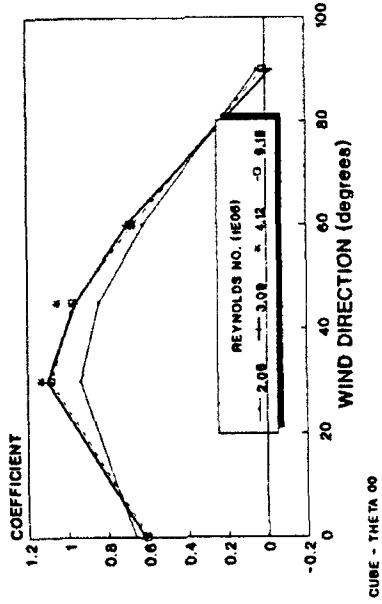
MEAN FORCE COEFFICIENT
NORMAL DIRECTION



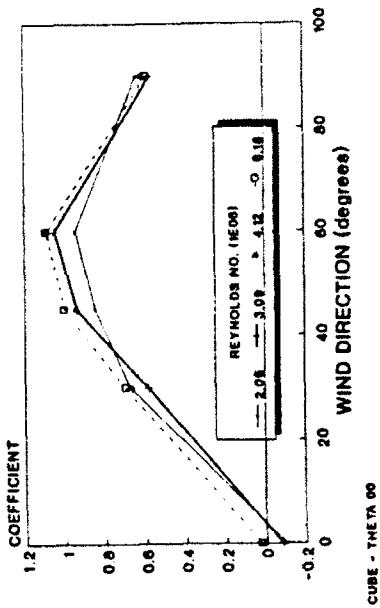
MEAN FORCE COEFFICIENT
LATERAL DIRECTION



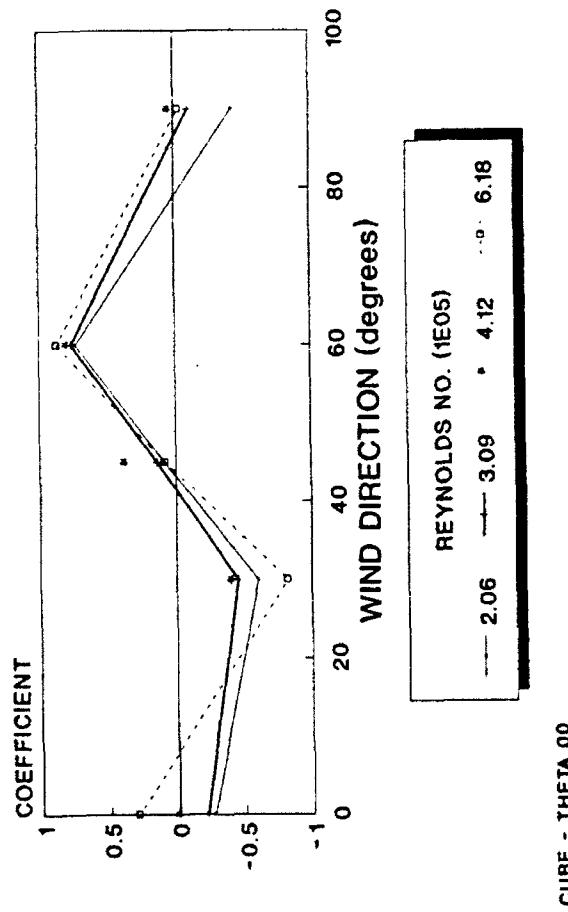
**MEAN MOMENT COEFFICIENT
NORMAL DIRECTION**



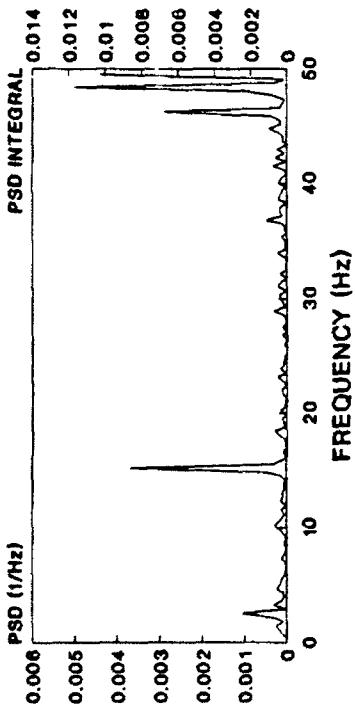
**MEAN MOMENT COEFFICIENT
LATERAL DIRECTION**



**MEAN MOMENT COEFFICIENT
ROLL DIRECTION**

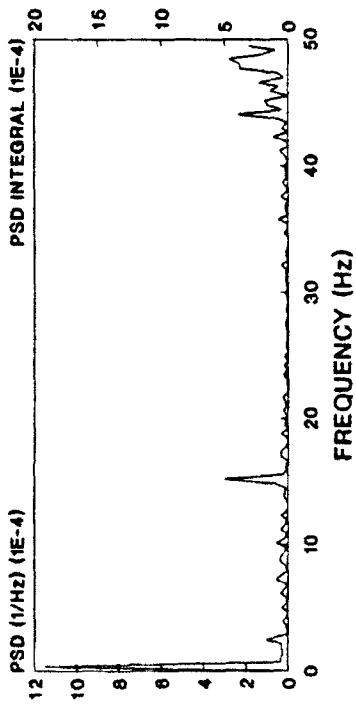


FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



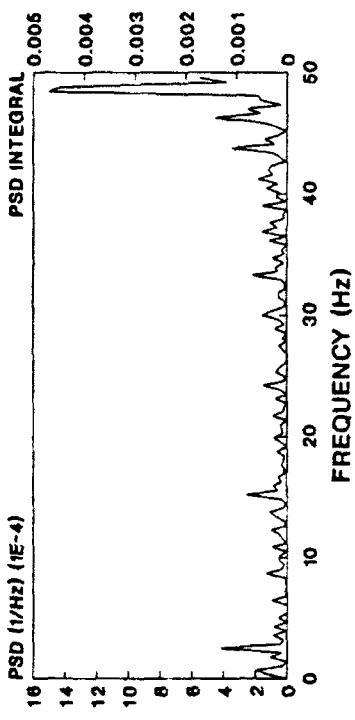
CUBE2 - THETA 00 - AZIMUTH - 000

FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



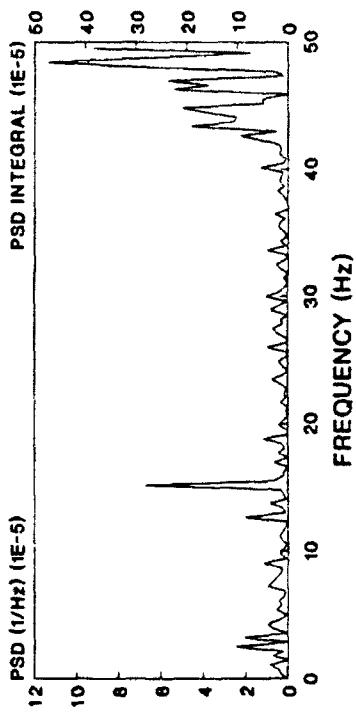
CUBE2 - THETA 00 - AZIMUTH - 000

FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



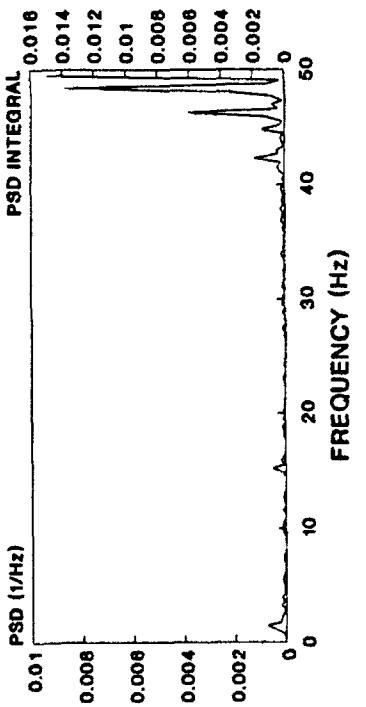
CUBE2 - THETA 00 - AZIMUTH - 000

FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



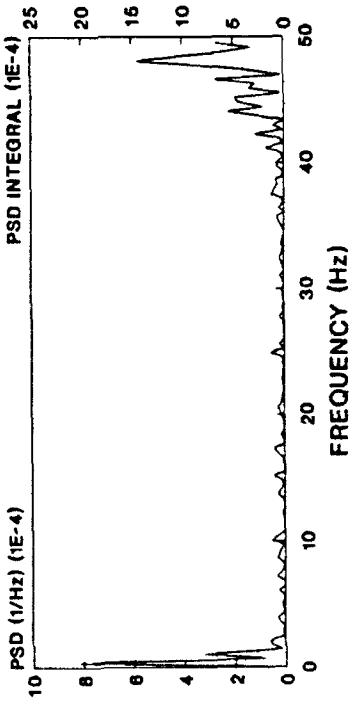
CUBE2 - THETA 00 - AZIMUTH - 000

**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



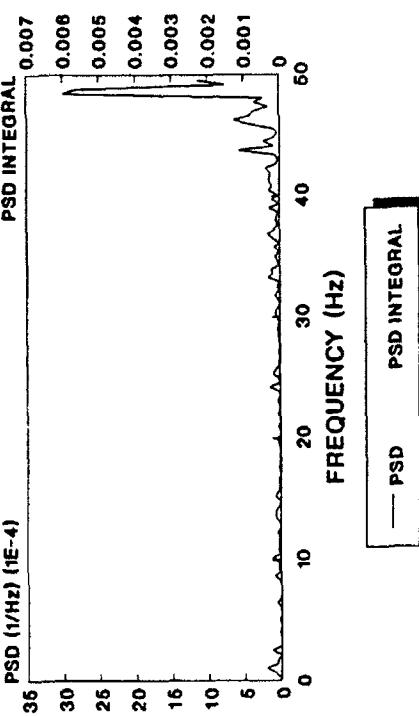
CUBE - THETA 00 - AZIMUTH - 000

**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



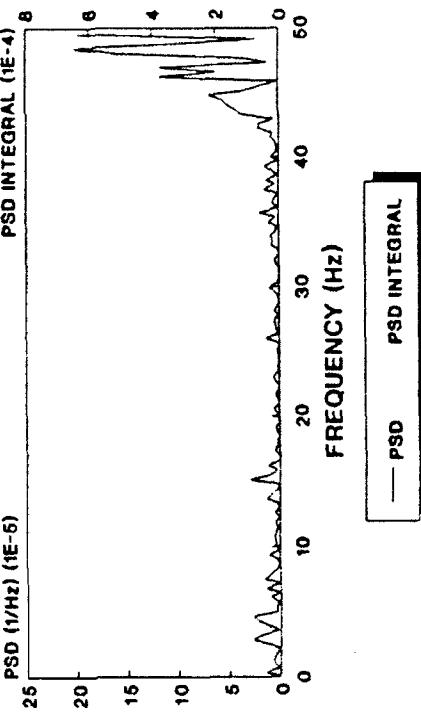
CUBE - THETA 00 - AZIMUTH - 000

**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



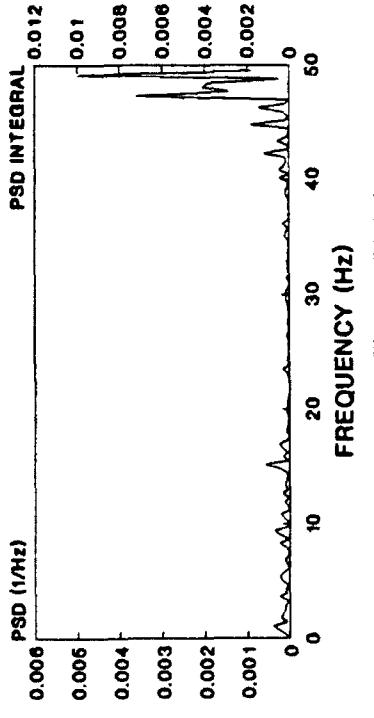
CUBE - THETA 00 - AZIMUTH - 000

**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**

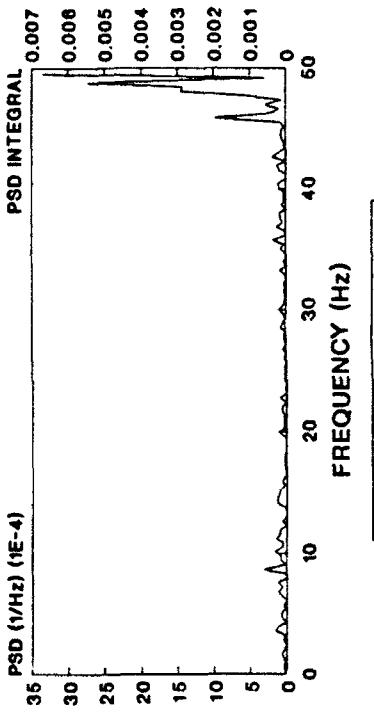


CUBE - THETA 00 - AZIMUTH - 000

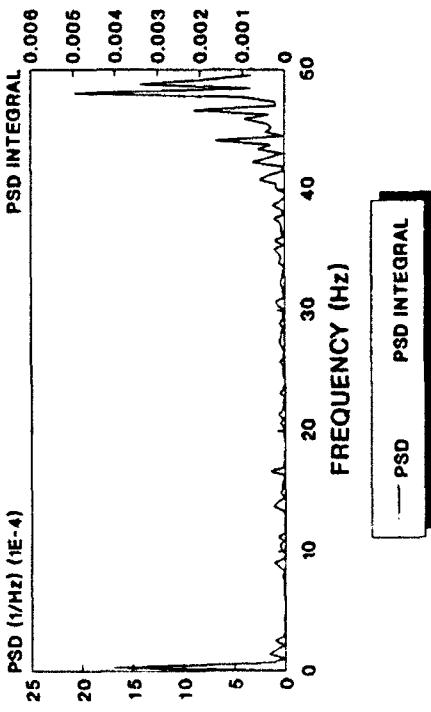
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



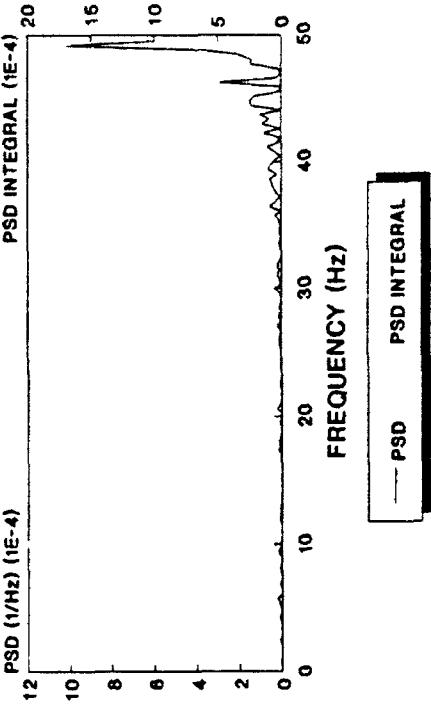
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



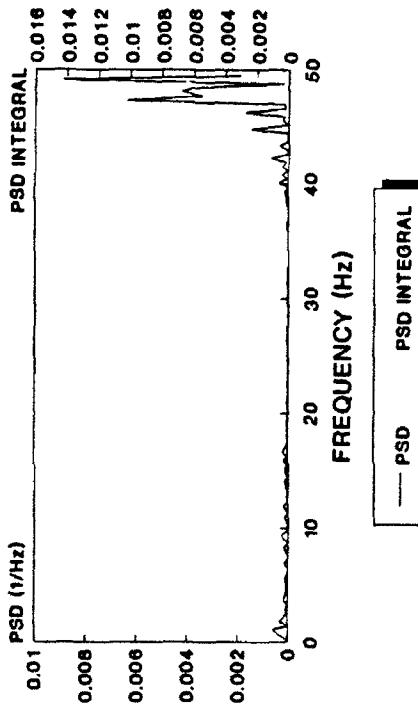
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



FORCE COEFF - LATERAL 180 FT/SEC NOMINAL

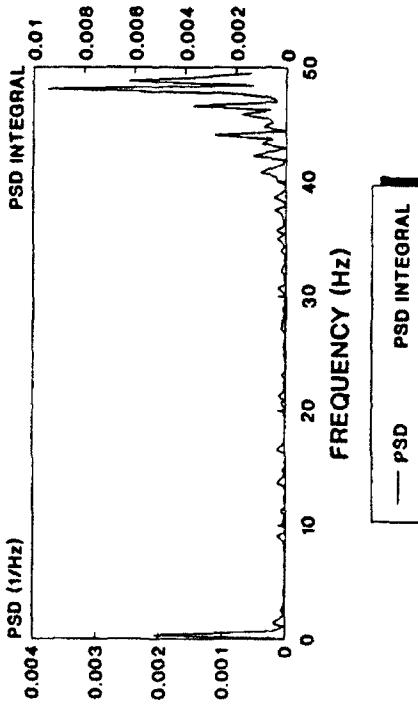


MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



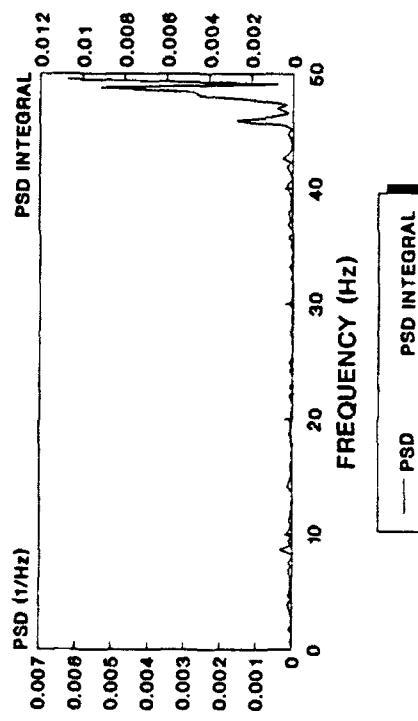
CUBE2 - THETA 00 - AZIMUTH - 000

MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



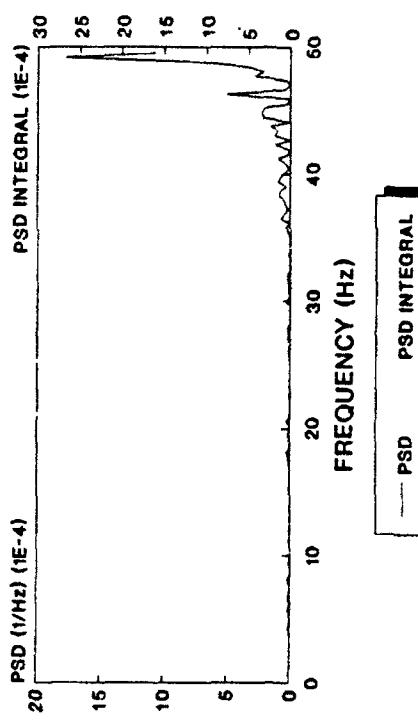
CUBE2 - THETA 00 - AZIMUTH - 000

MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



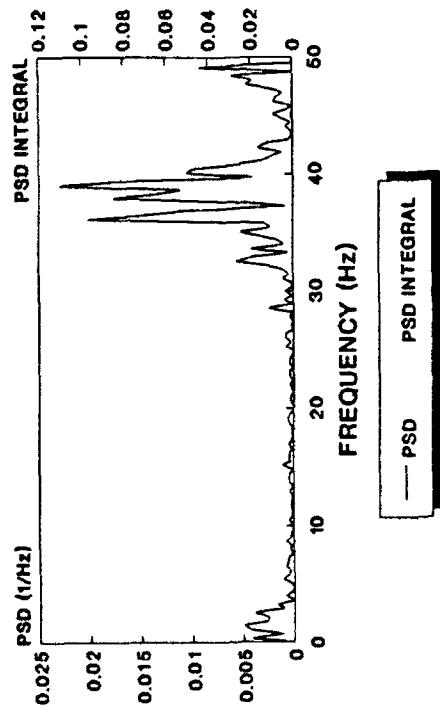
CUBE2 - THETA 00 - AZIMUTH - 000

MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



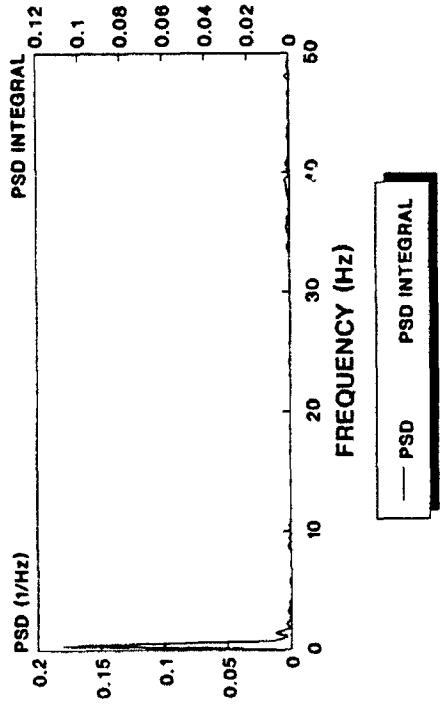
CUBE2 - THETA 00 - AZIMUTH - 000

MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



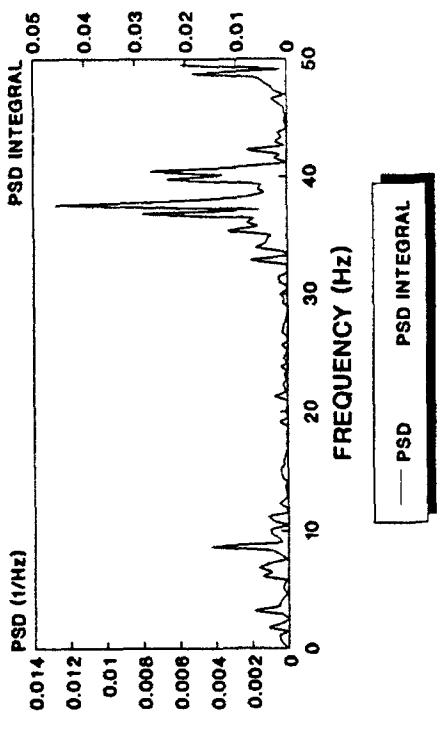
CUBE2 - THETA 00 - AZIMUTH - 000

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



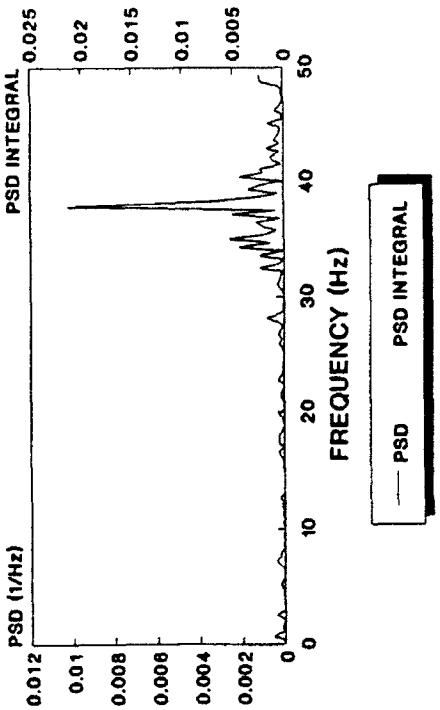
CUBE2 - THETA 00 - AZIMUTH - 000

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



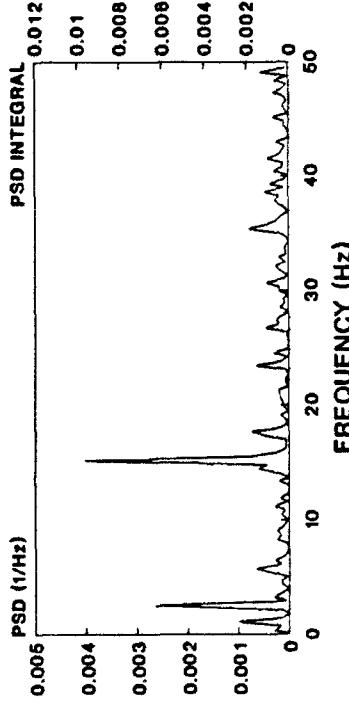
CUBE2 - THETA 00 - AZIMUTH - 000

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



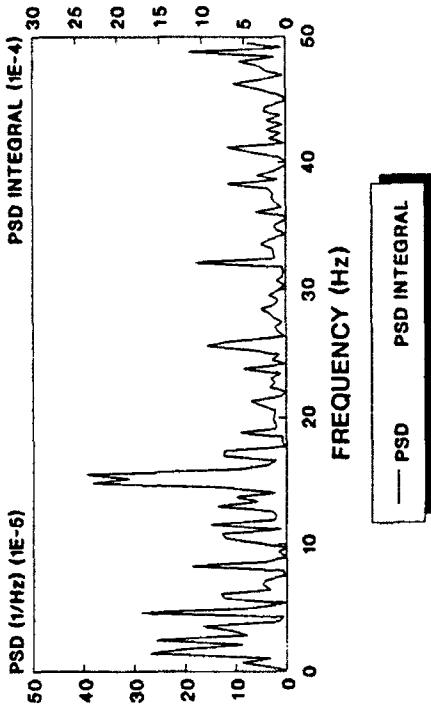
CUBE2 - THETA 00 - AZIMUTH - 000

FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



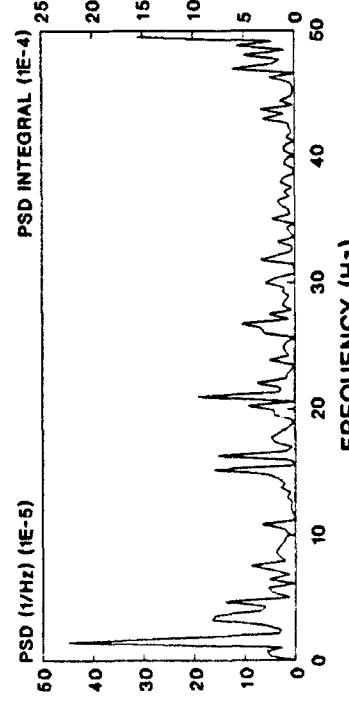
CUBE2 - THETA 00 - AZIMUTH - 030

FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



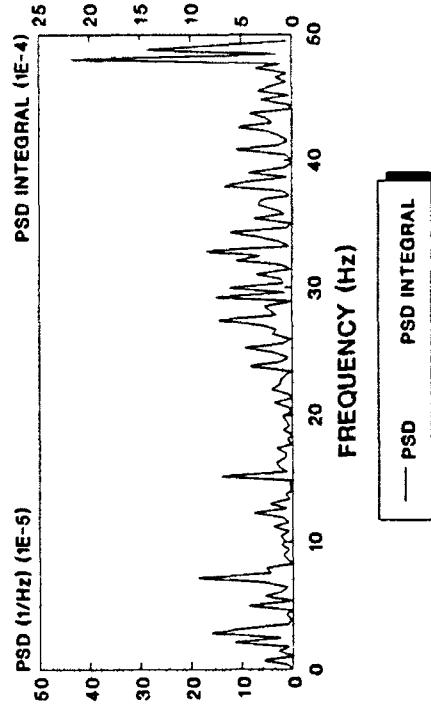
CUBE2 - THETA 00 - AZIMUTH - 030

FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



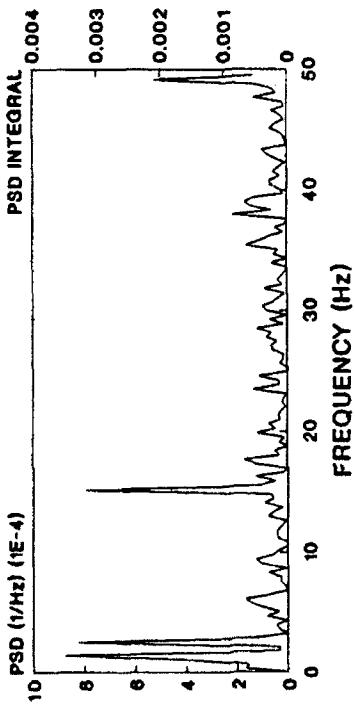
CUBE2 - THETA 00 - AZIMUTH - 030

FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



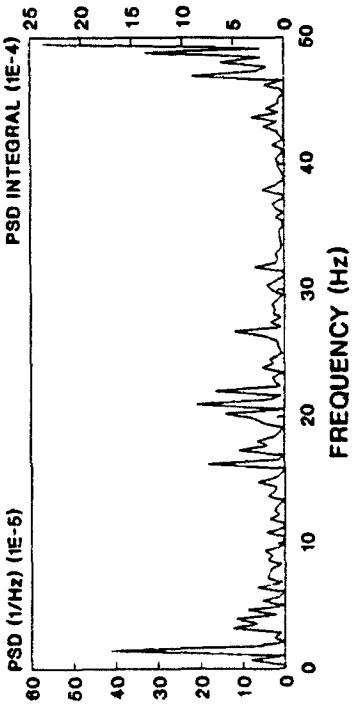
CUBE2 - THETA 00 - AZIMUTH - 030

**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



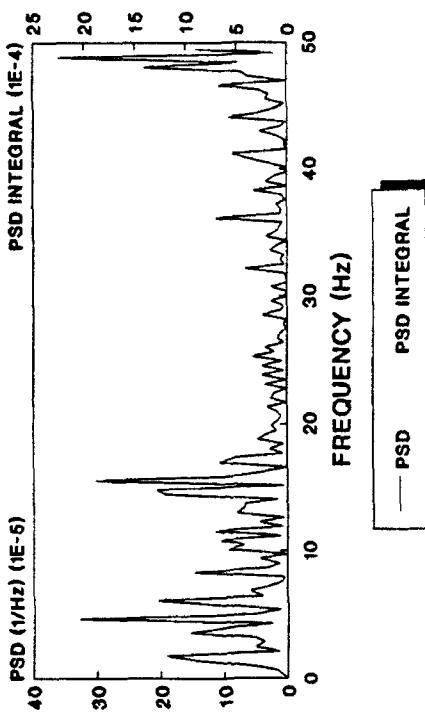
CUBE2 - THETA 00 - AZIMUTH - 030

**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



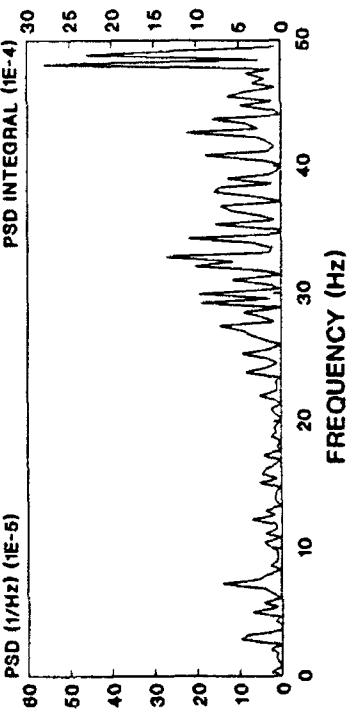
CUBE2 - THETA 00 - AZIMUTH - 030

**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



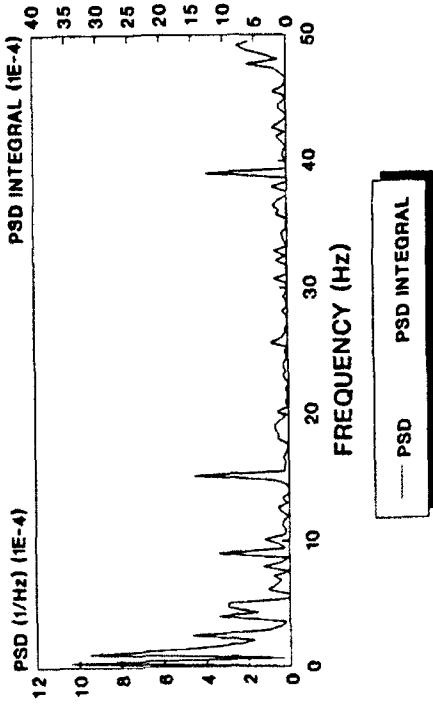
CUBE2 - THETA 00 - AZIMUTH - 030

**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**

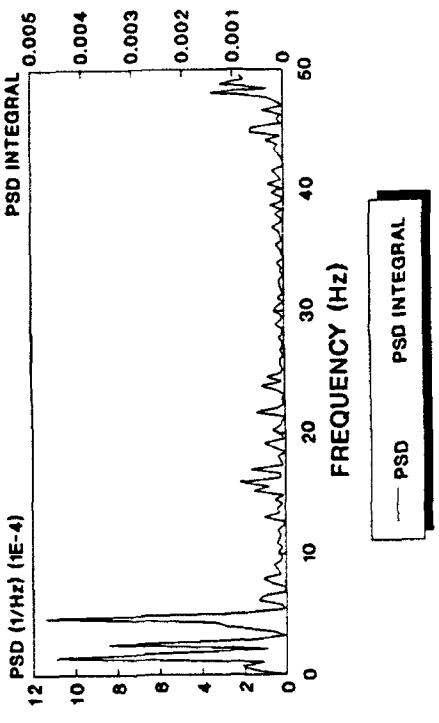


CUBE2 - THETA 00 - AZIMUTH - 030

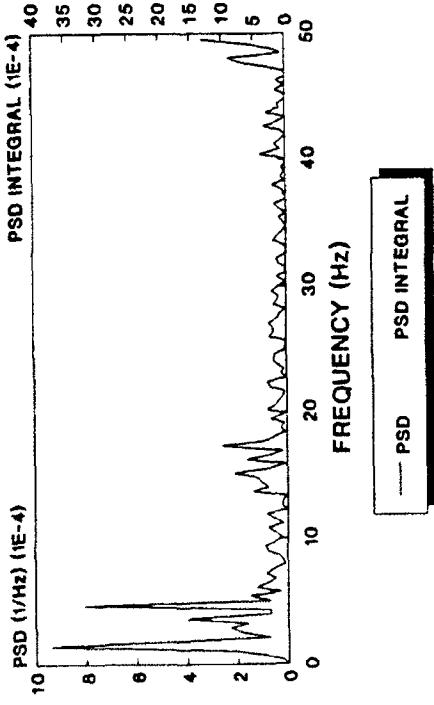
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



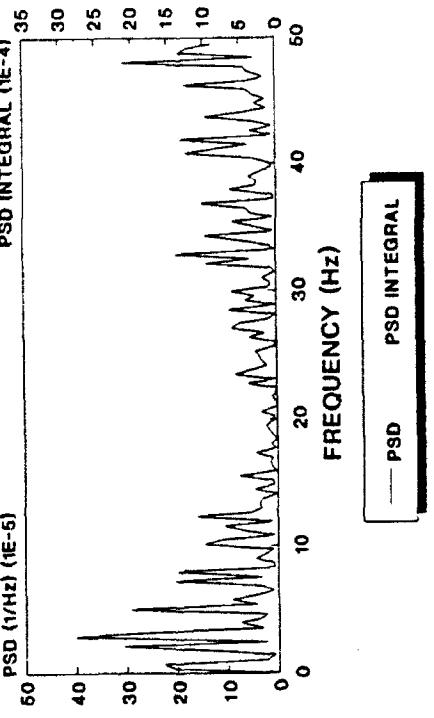
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



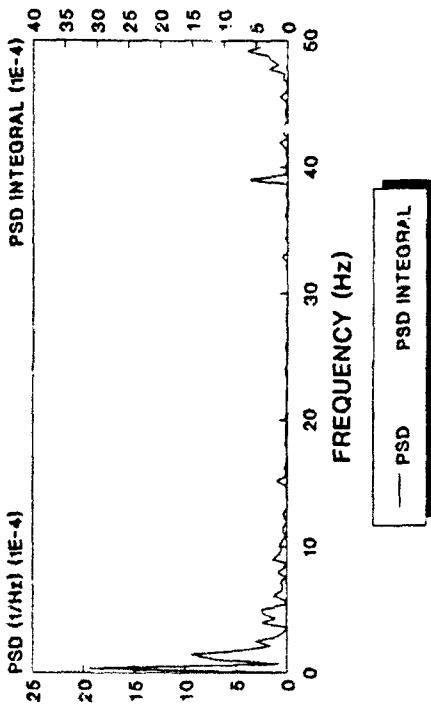
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



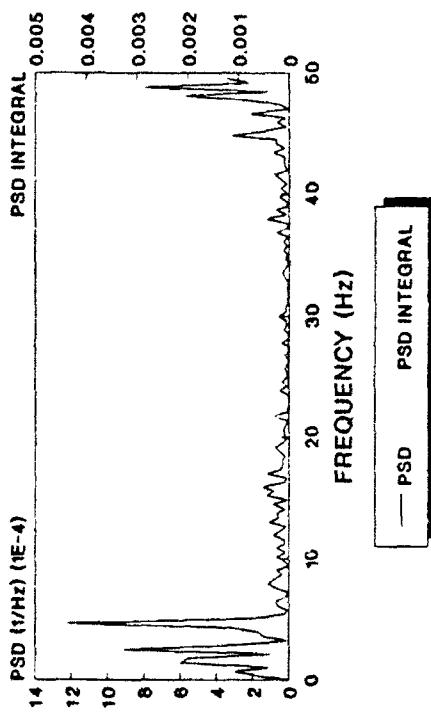
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



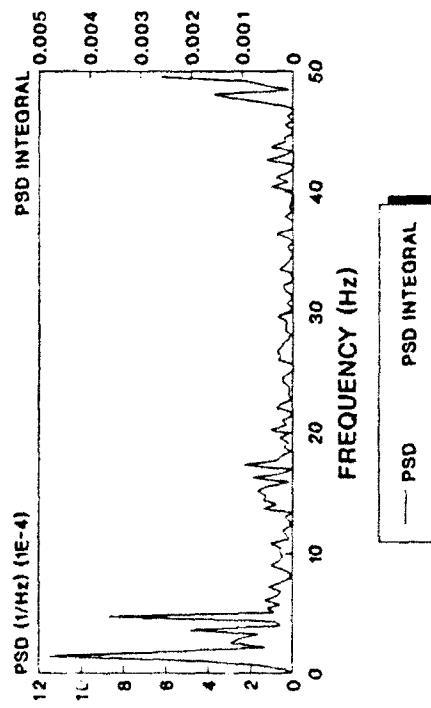
MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



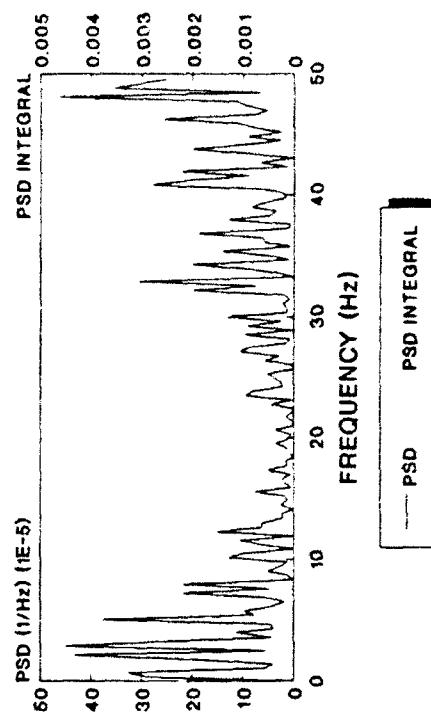
MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



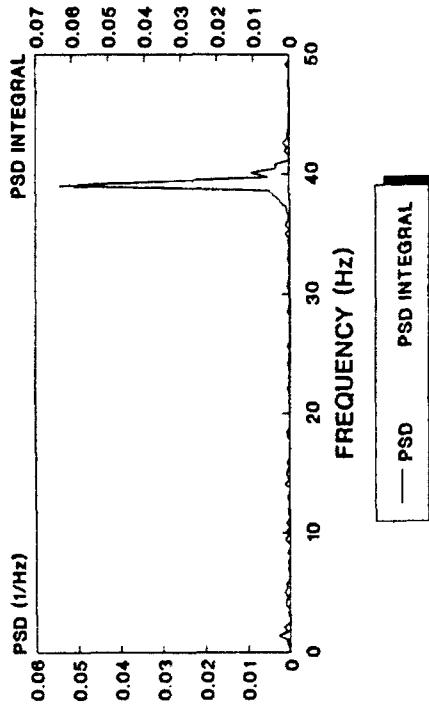
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



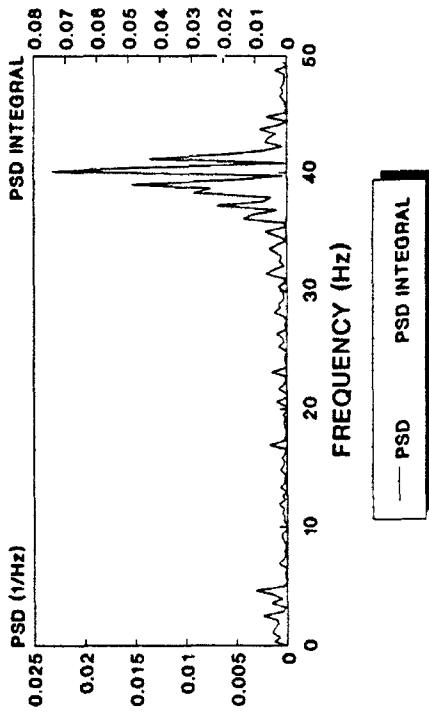
MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



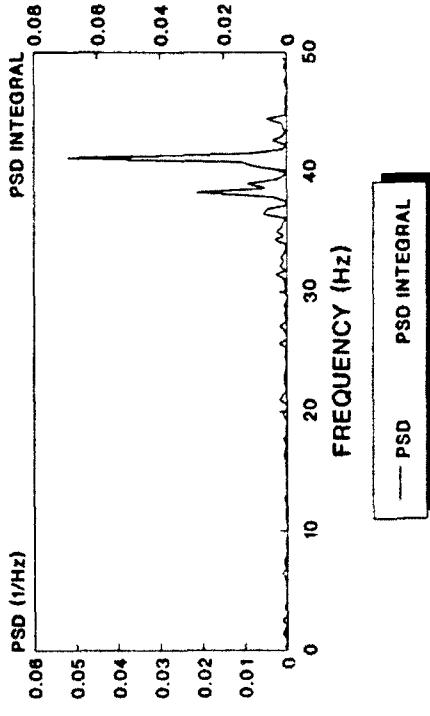
MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



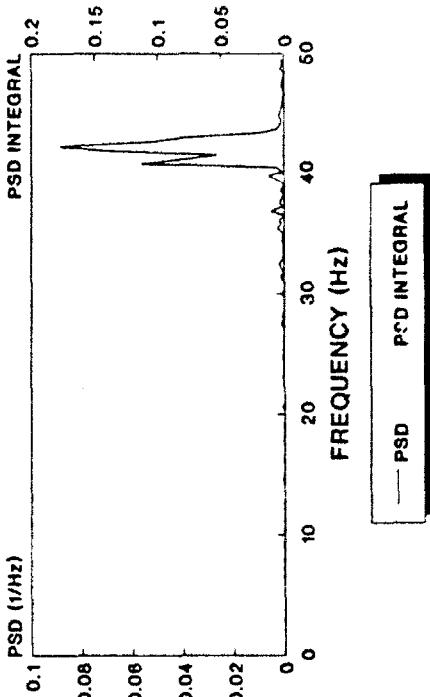
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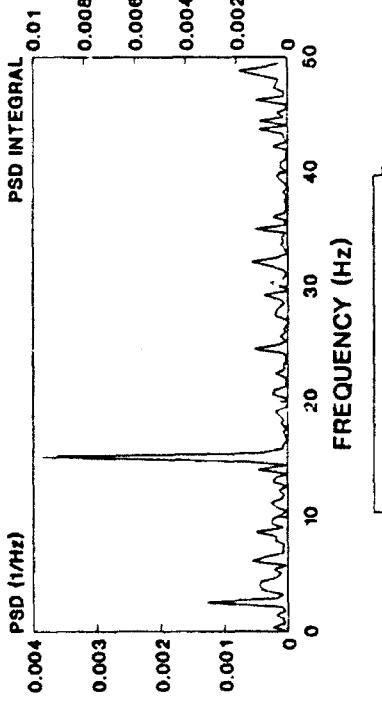
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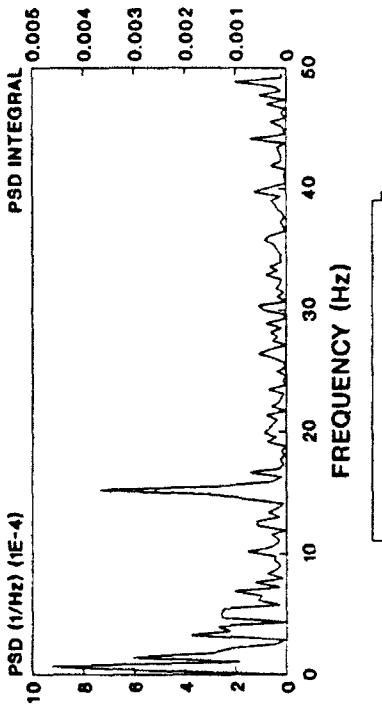
MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



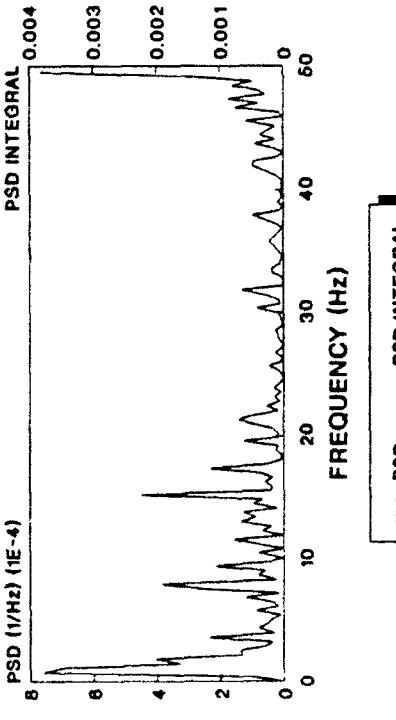
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



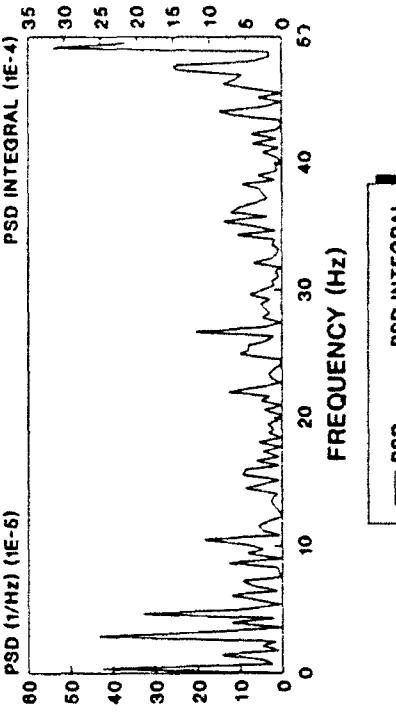
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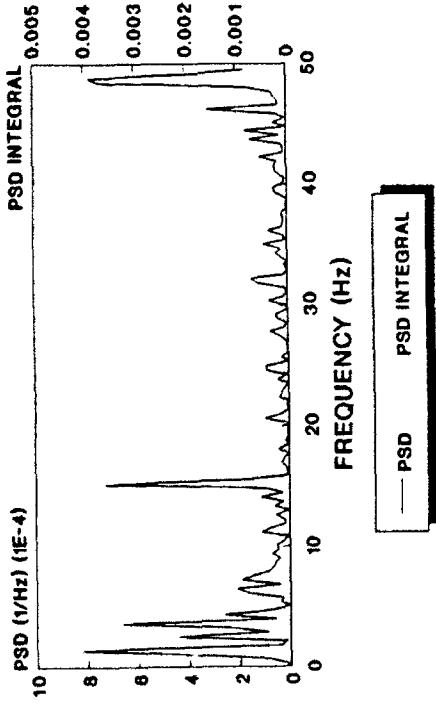
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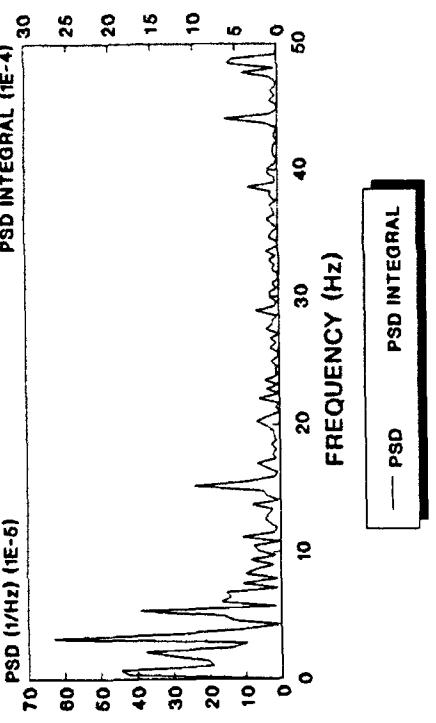
FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



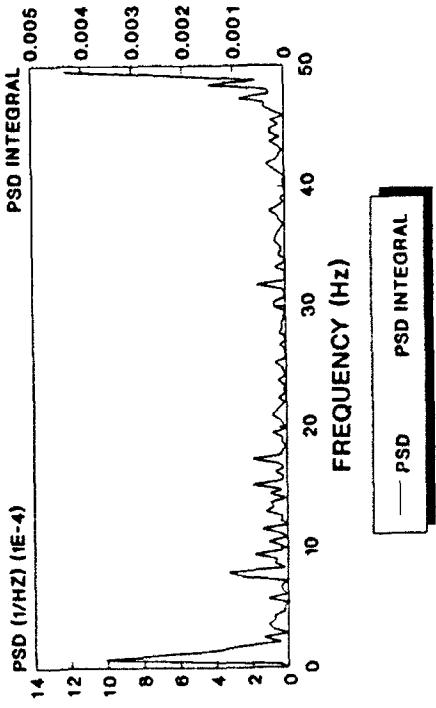
**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



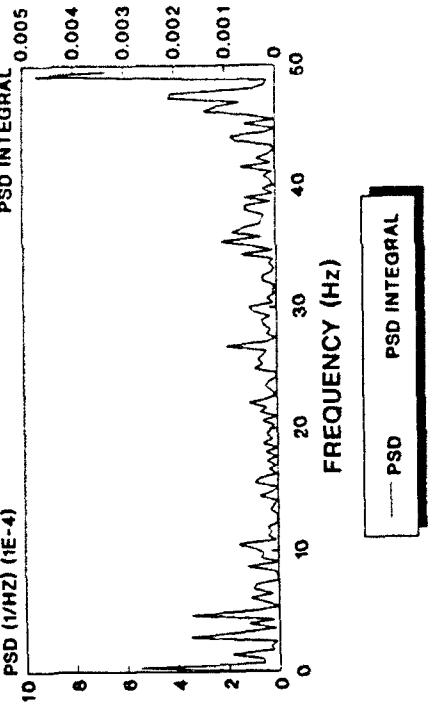
**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



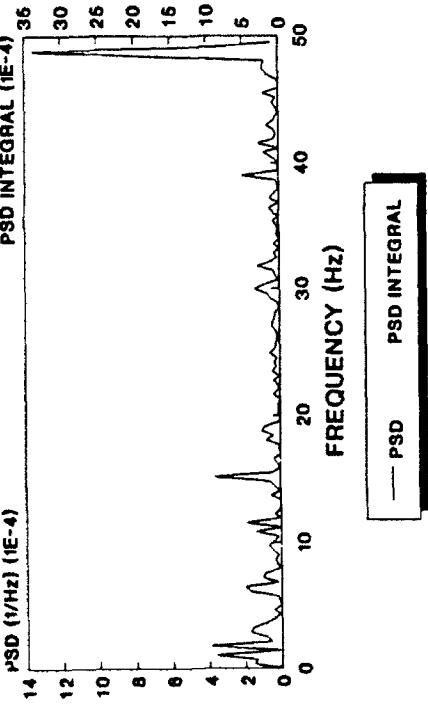
**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



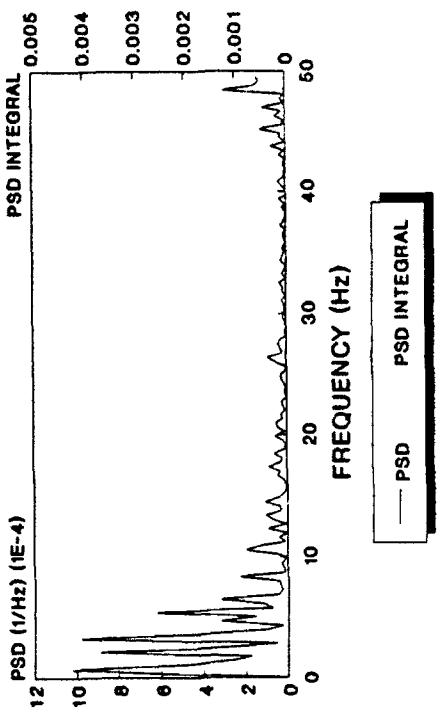
**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



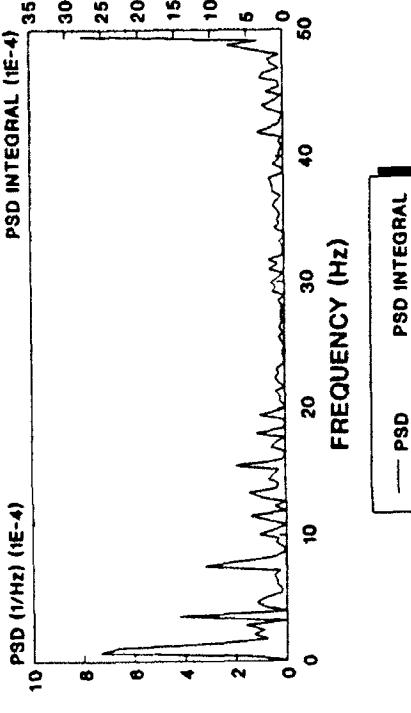
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



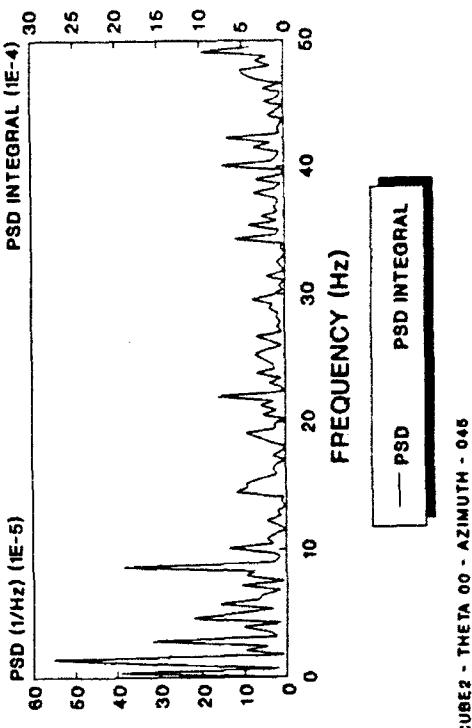
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



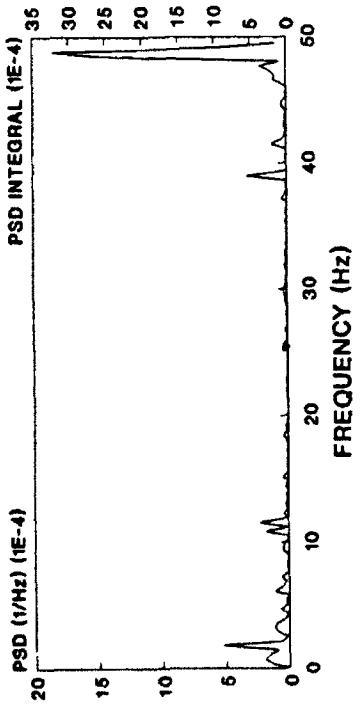
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



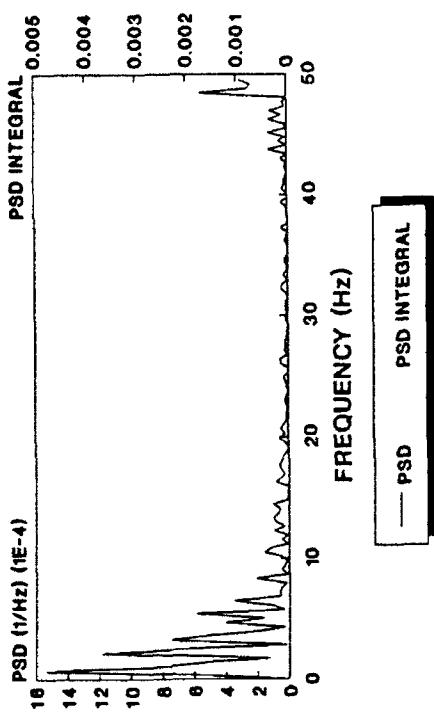
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



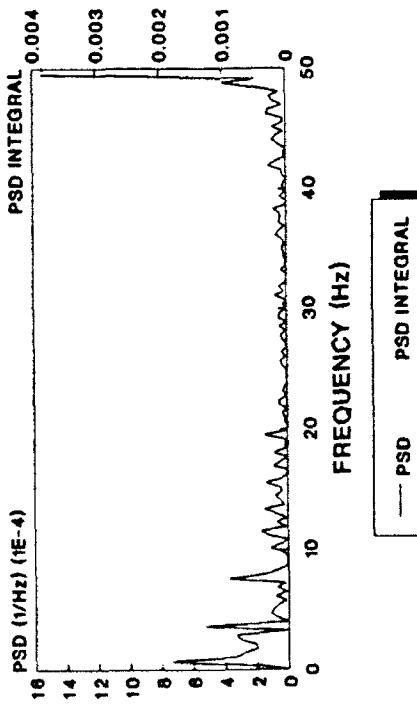
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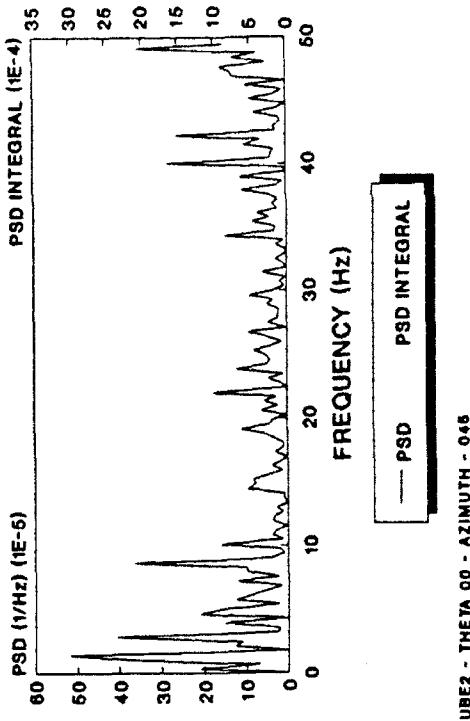
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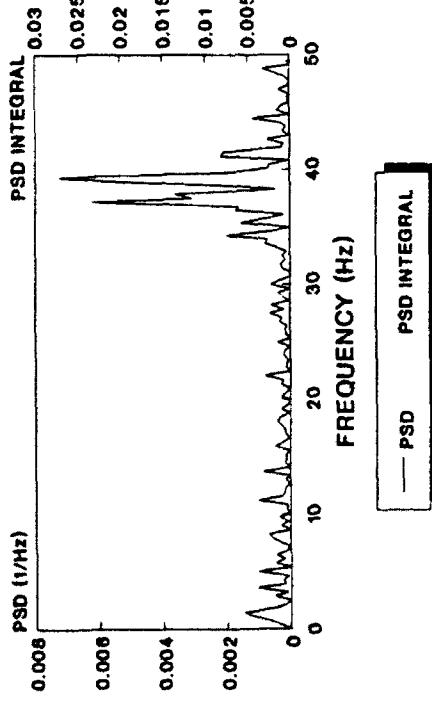
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL

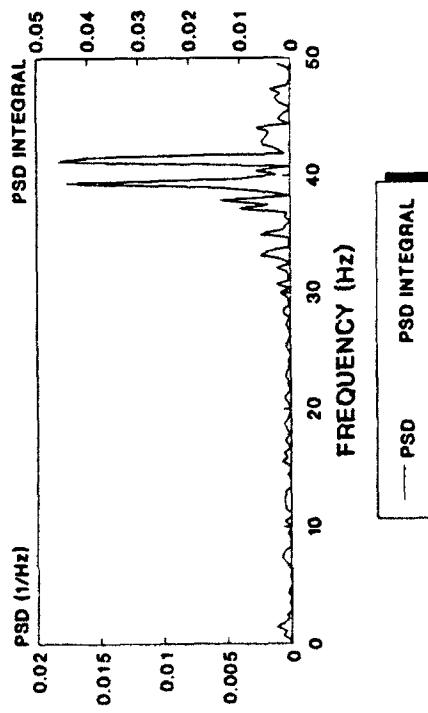


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



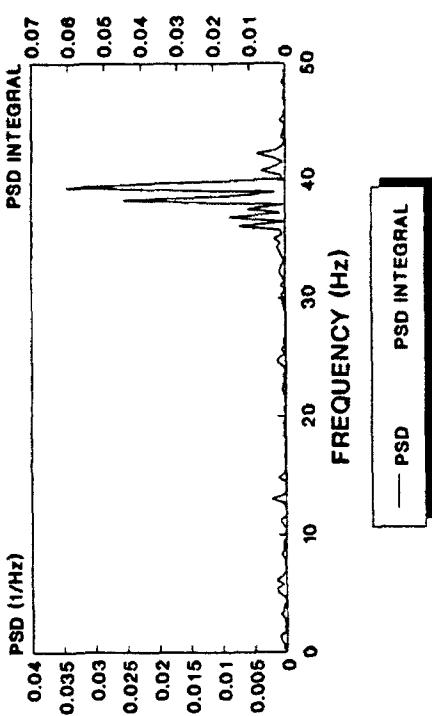
CUBE2 - THETA 00 - AZIMUTH - 045

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



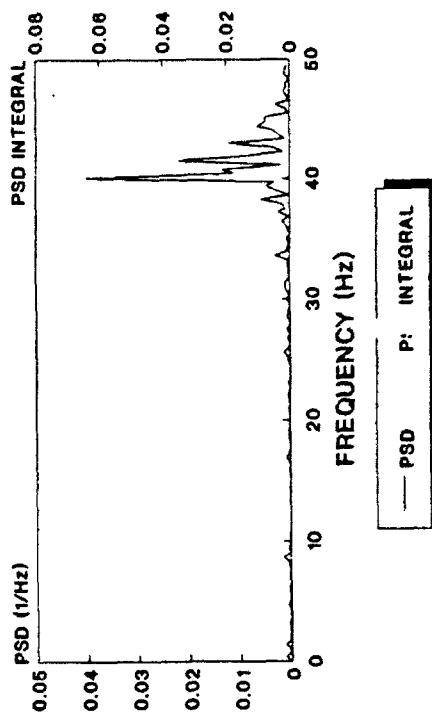
CUBE2 - THETA 00 - AZIMUTH - 045

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



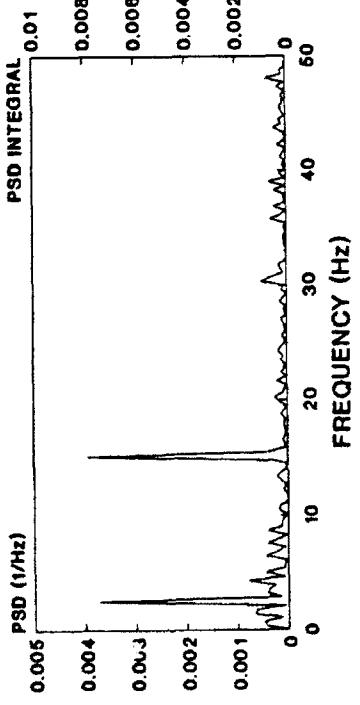
CUBE2 - THETA 00 - AZIMUTH - 045

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

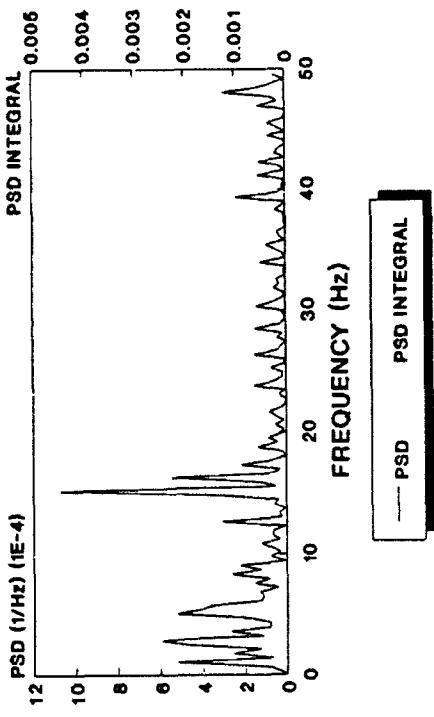


CUBE2 - THETA 00 - AZIMUTH - 045

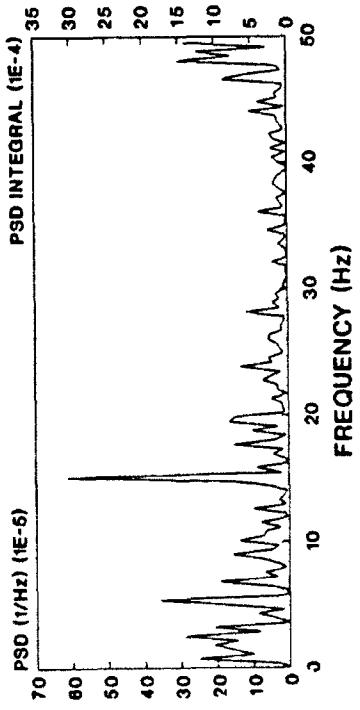
**FORCE COEFF - NORMAL
60 FT/SEC NOMINAL**



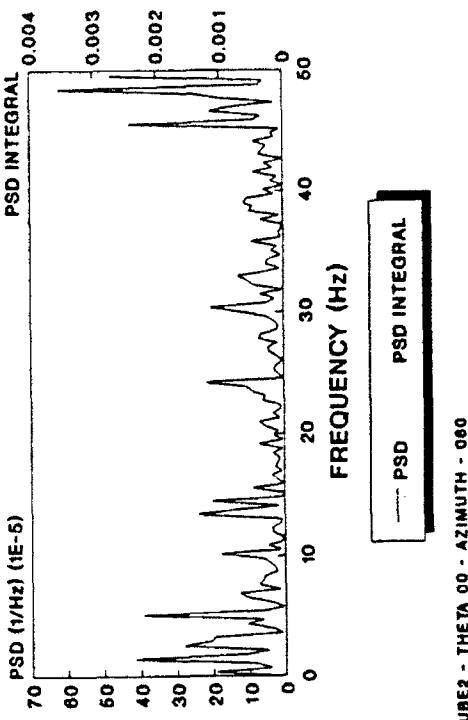
**FORCE COEFF - NORMAL
90 FT/SEC NOMINAL**



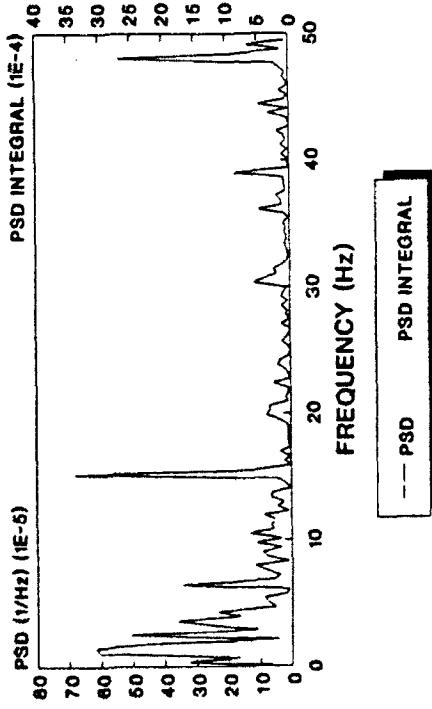
**FORCE COEFF - NORMAL
120 FT/SEC NOMINAL**



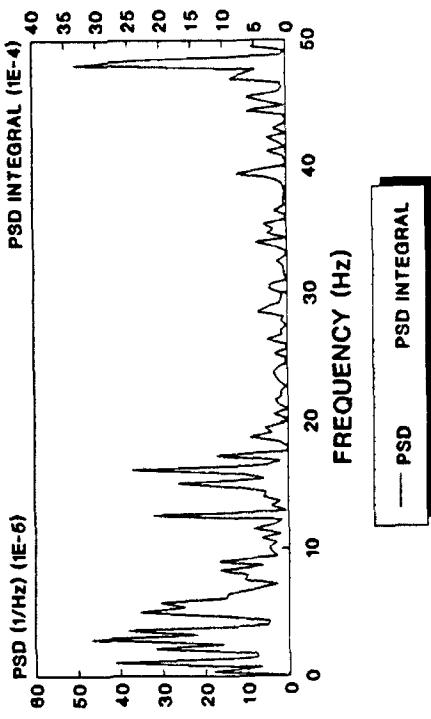
**FORCE COEFF - NORMAL
180 FT/SEC NOMINAL**



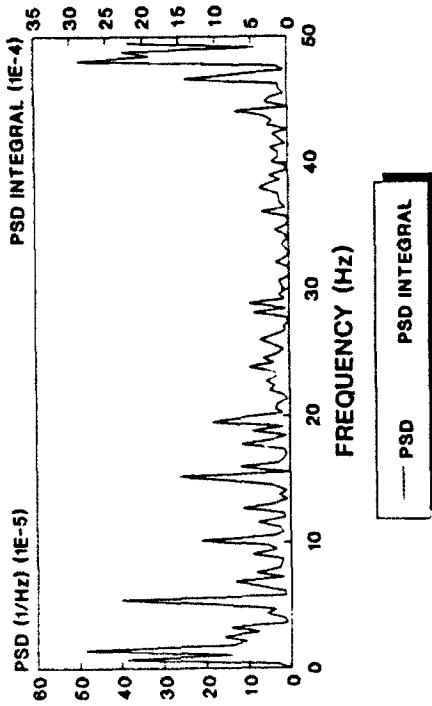
**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



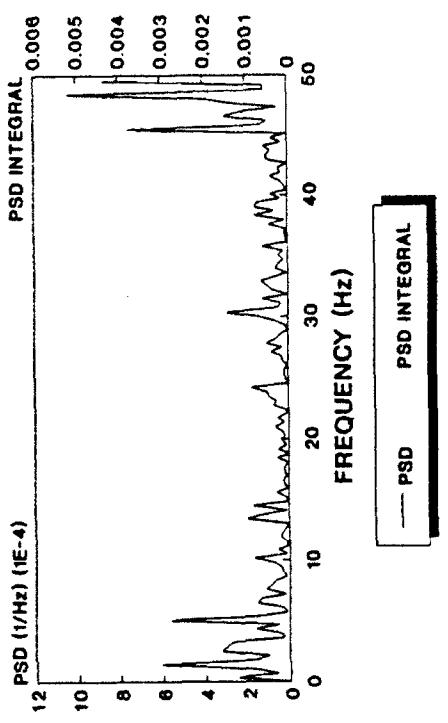
**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



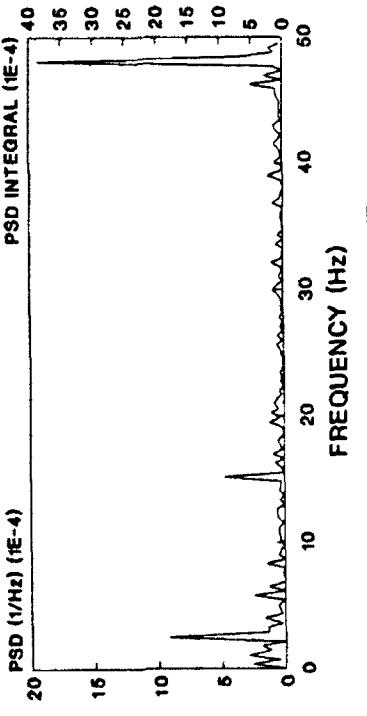
**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



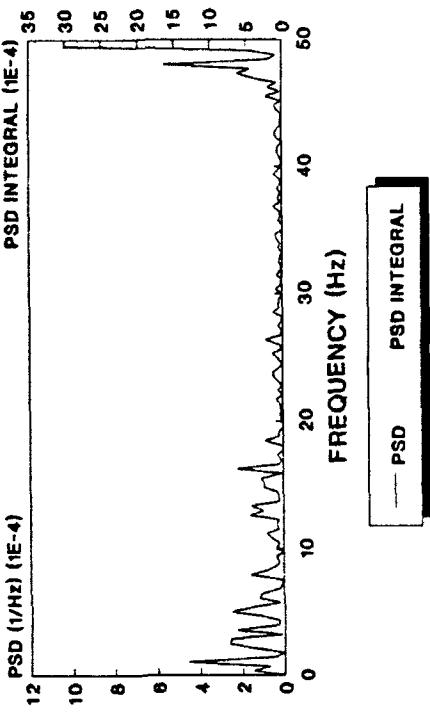
**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



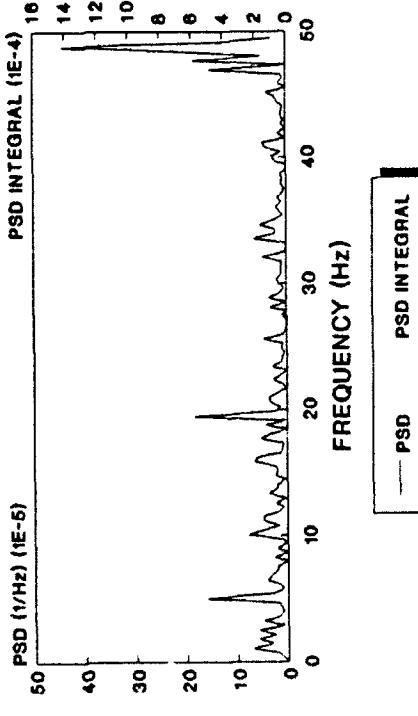
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



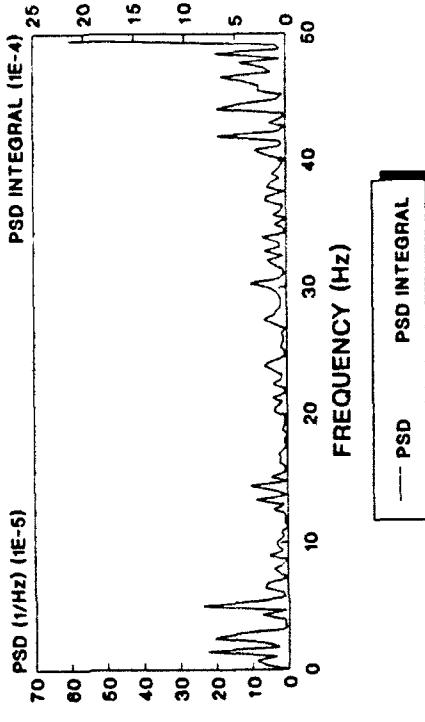
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



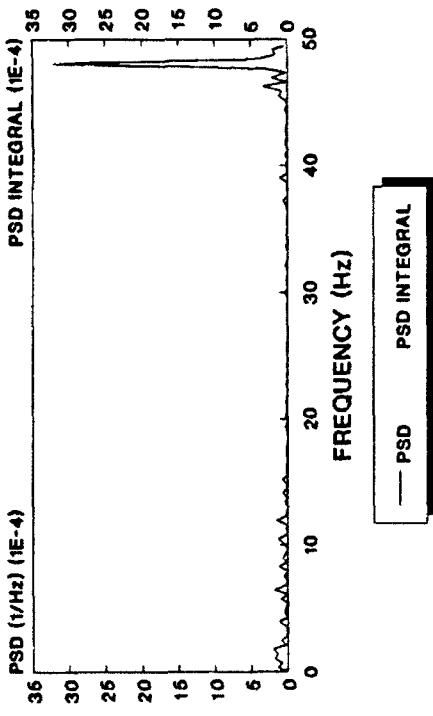
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



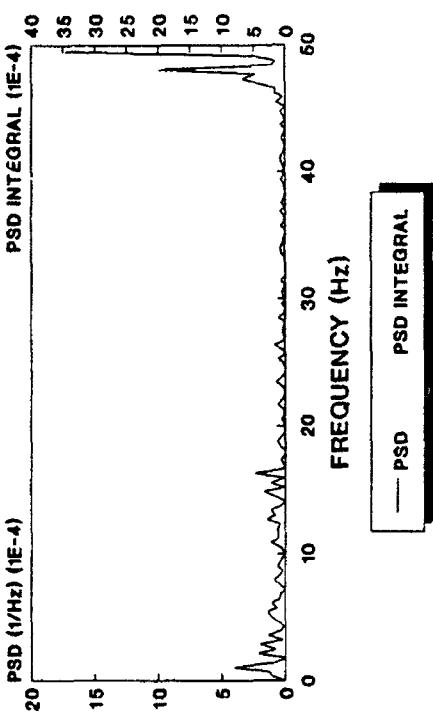
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



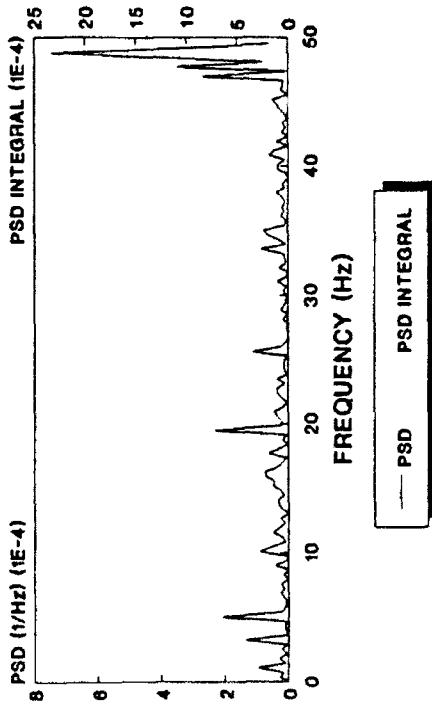
MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



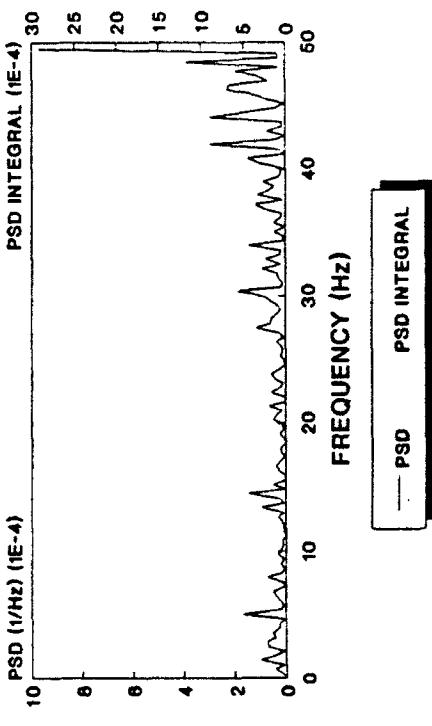
MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



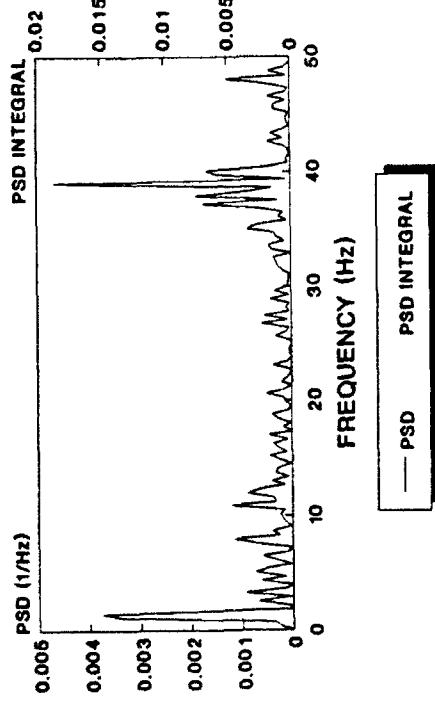
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL

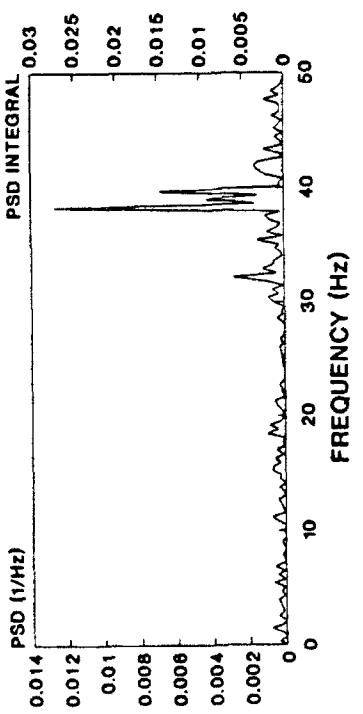


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



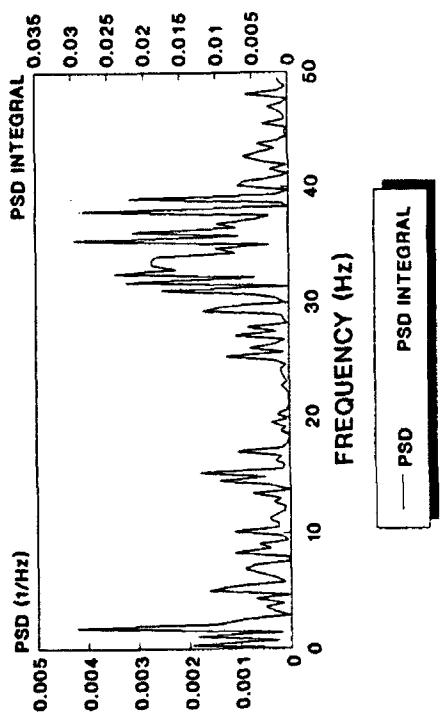
CUBE2 - THETA 00 - AZIMUTH - 060

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



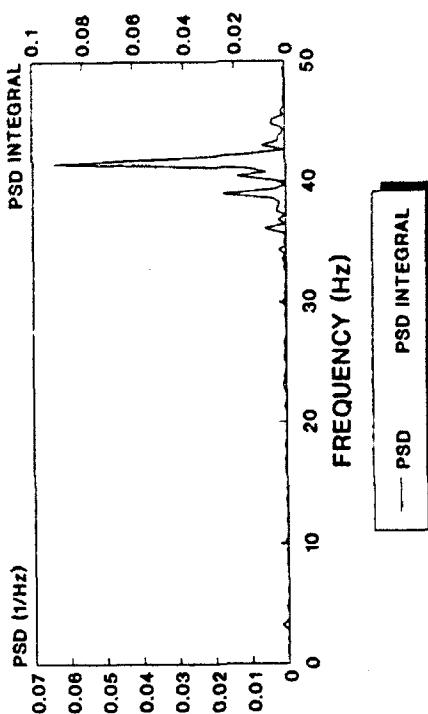
CUBE2 - THETA 00 - AZIMUTH - 060

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



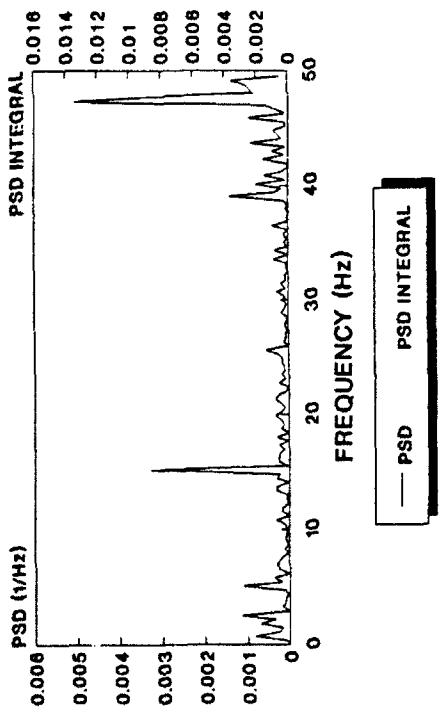
CUBE2 - THETA 00 - AZIMUTH - 060

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



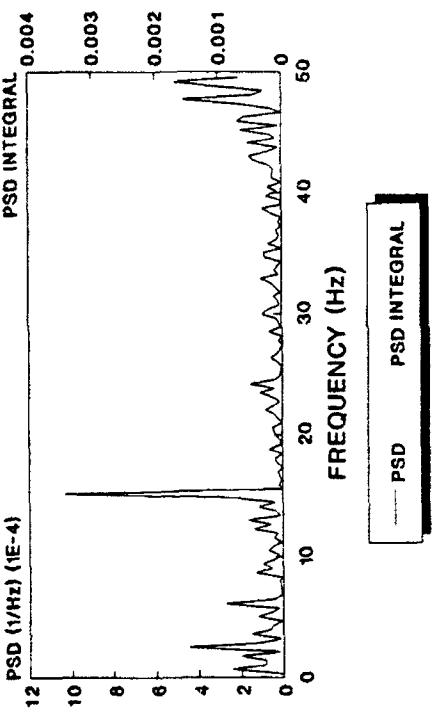
CUBE2 - THETA 00 - AZIMUTH - 060

**FORCE COEFF - NORMAL
60 FT/SEC NOMINAL**



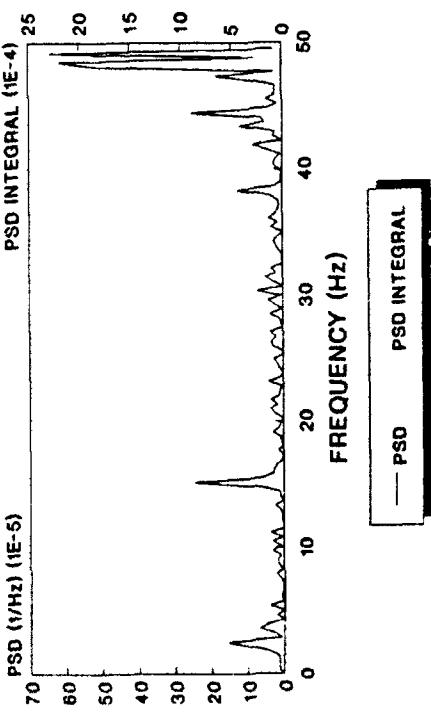
CUBE2 - THETA 00 - AZIMUTH - 090

**FORCE COEFF - NORMAL
90 FT/SEC NOMINAL**



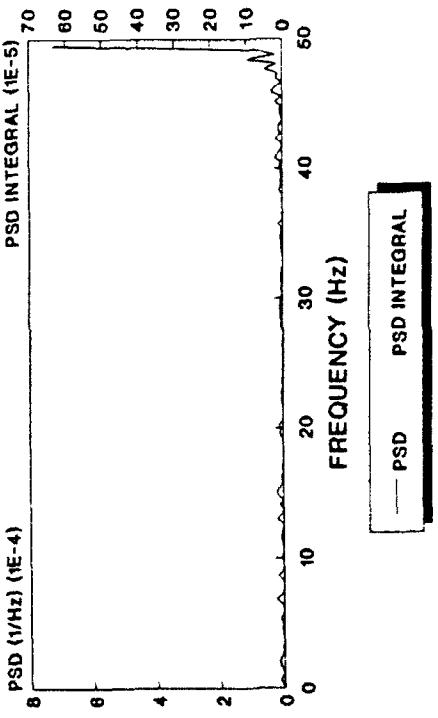
CUBE2 - THETA 00 - AZIMUTH - 000

FORCE COEFF - NORMAL
120 FT/SEC NOMINAL



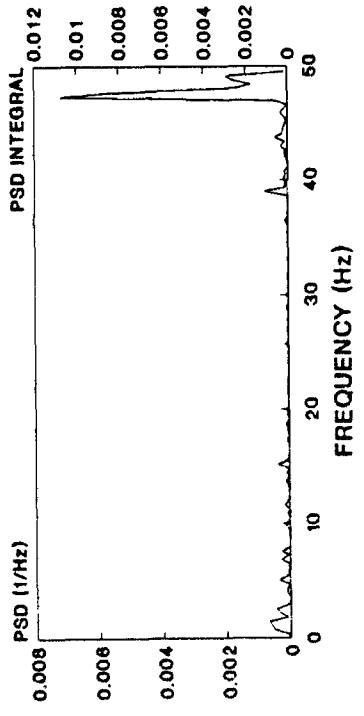
CUBE2 - THETA 00 - AZIMUTH - 080

FORCE COEFF - NORMAL
180 FT/SEC NOMINAL



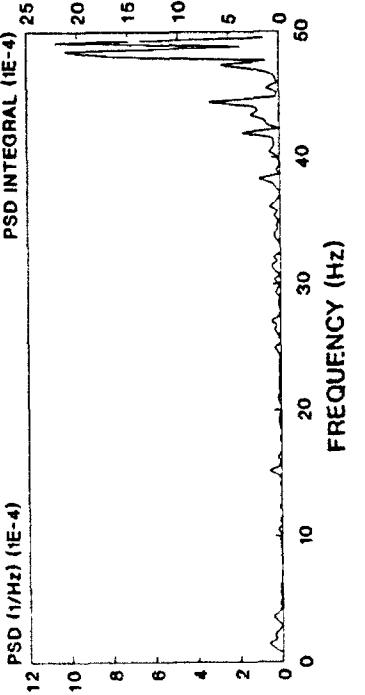
CUBE2 - THETA 00 - AZIMUTH - 090

**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



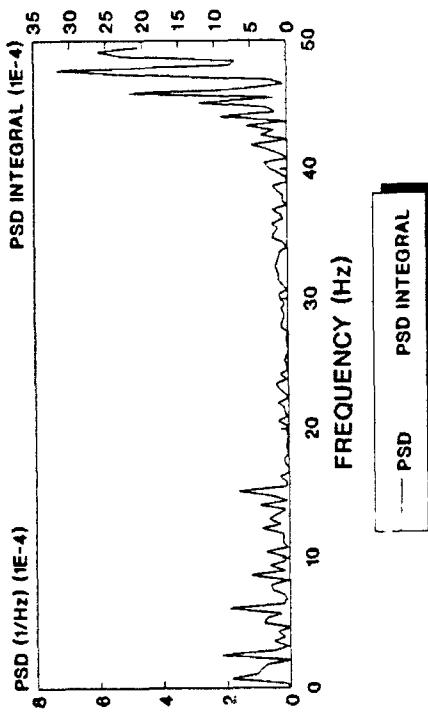
CUBE2 - THETA 00 - AZIMUTH - 090

**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



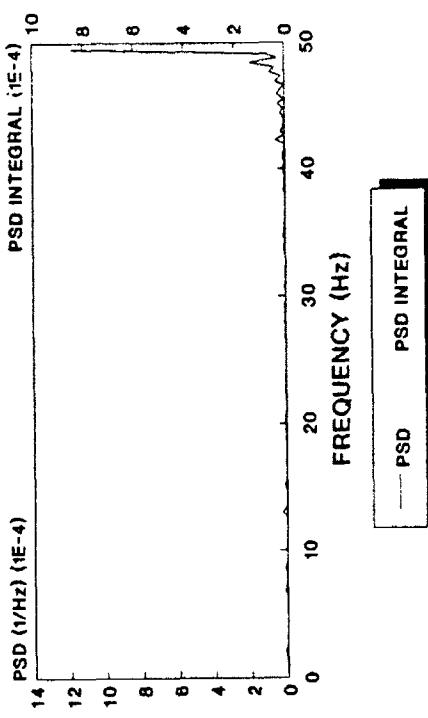
CUBE2 - THETA 00 - AZIMUTH - 090

**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



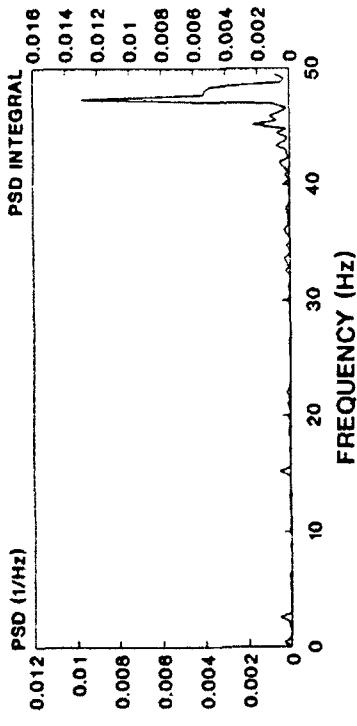
CUBE2 - THETA 00 - AZIMUTH - 090

**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



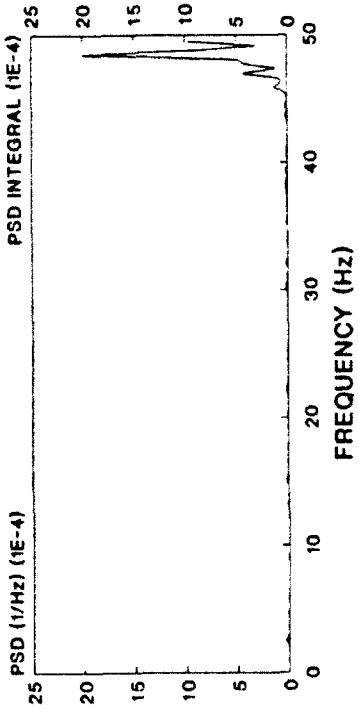
CUBE2 - THETA 00 - AZIMUTH - 090

FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



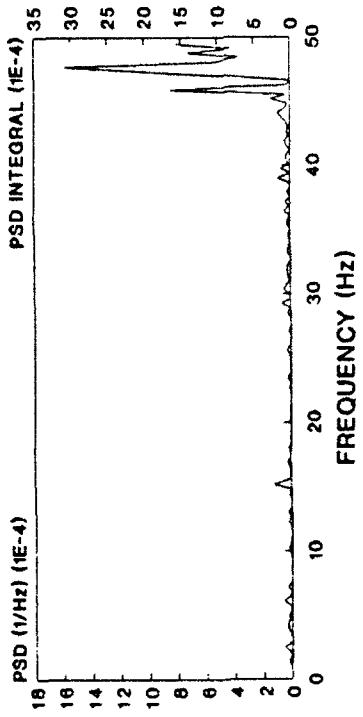
CUBE2 - THETA 00 - AZIMUTH - 090

FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



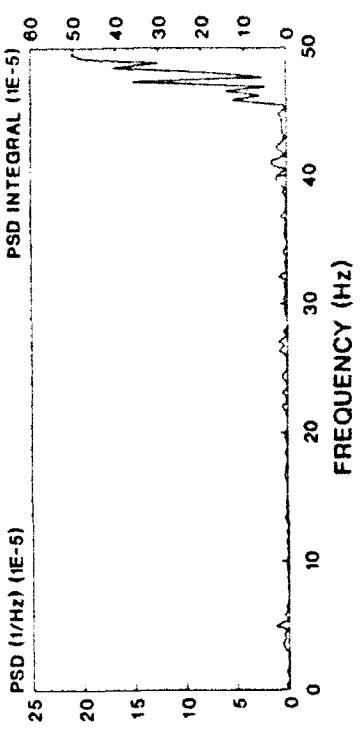
189

FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



CUBE2 - THETA 00 - AZIMUTH - 090

FORCE COEFF - LATERAL 180 FT/SEC NOMINAL

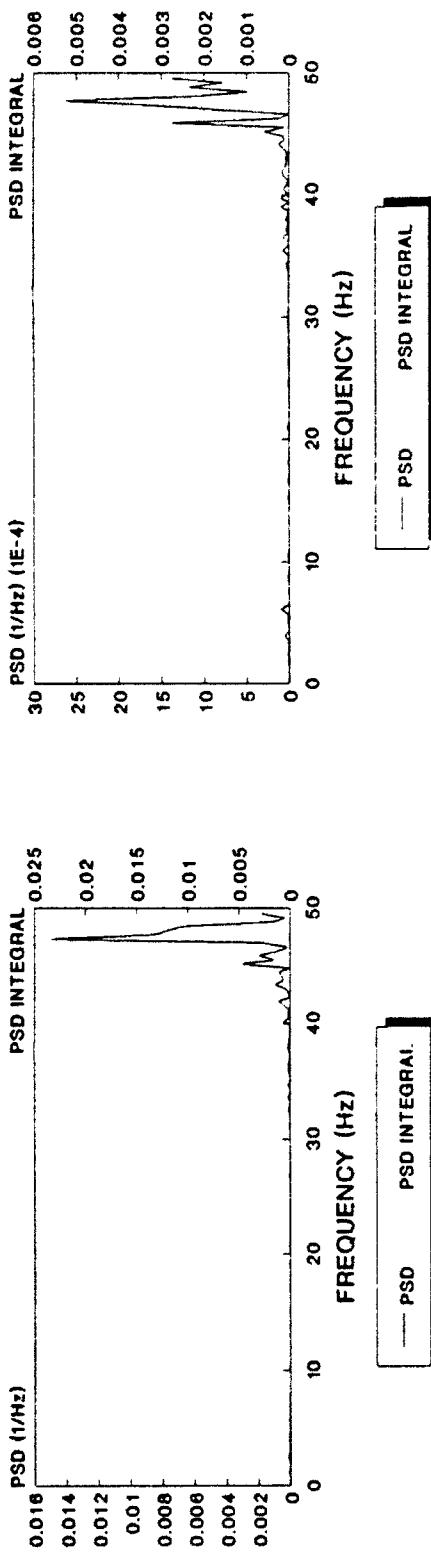


CUBE2 - THETA 00 - AZIMUTH - 090

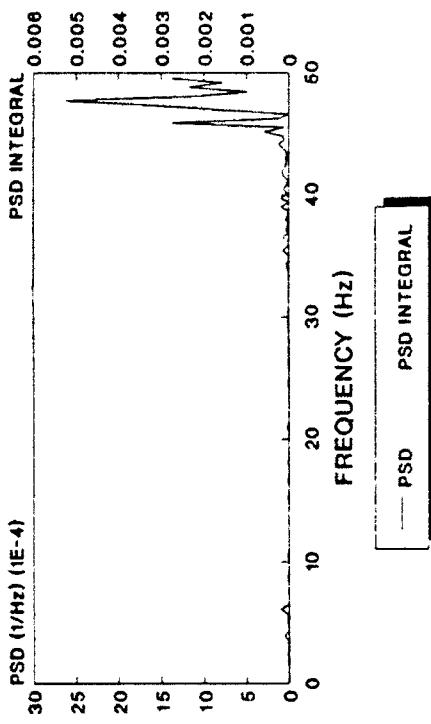
CUBE2 - THETA 00 - AZIMUTH - 090



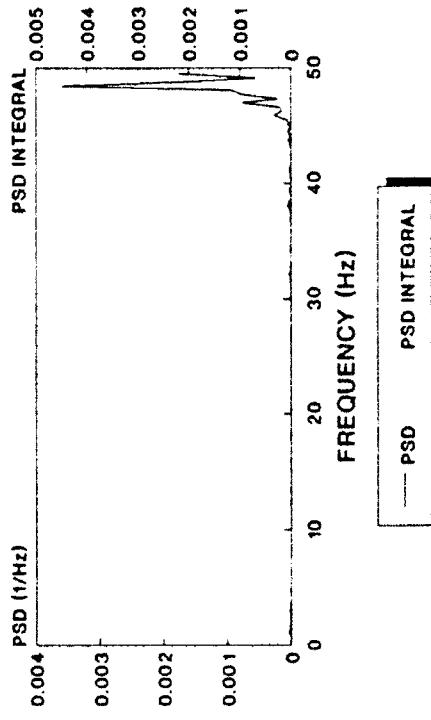
MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



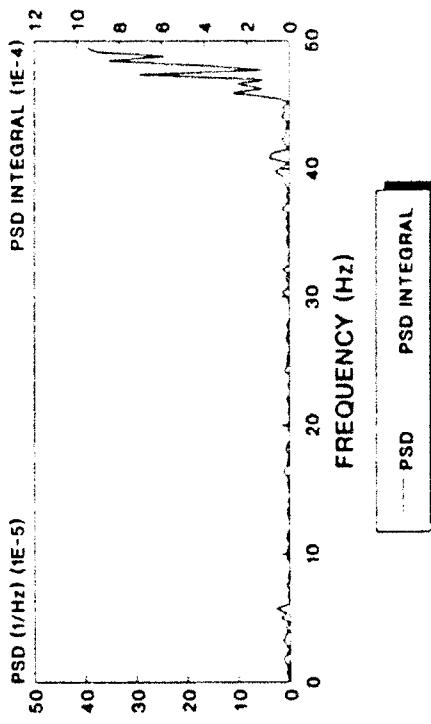
MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



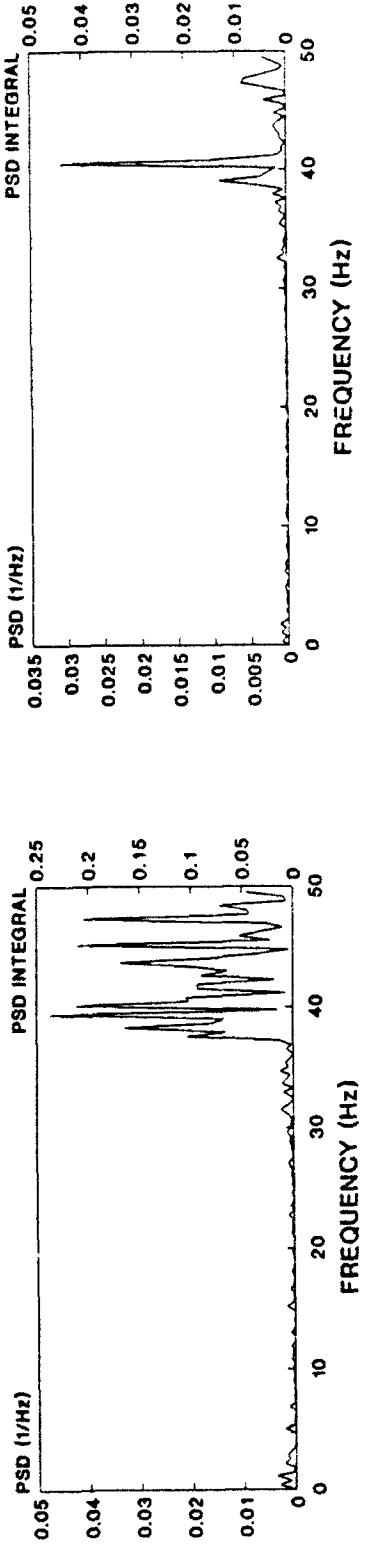
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



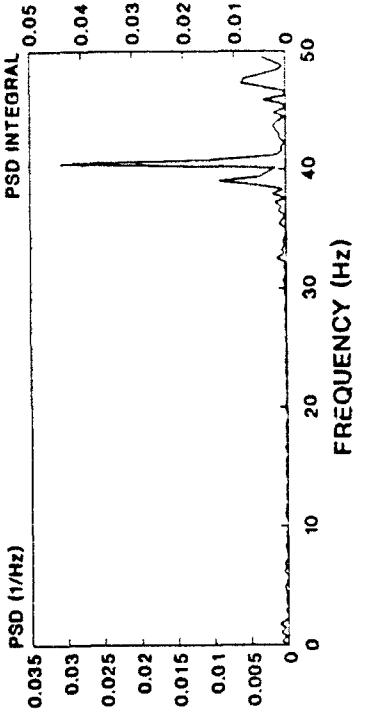
MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



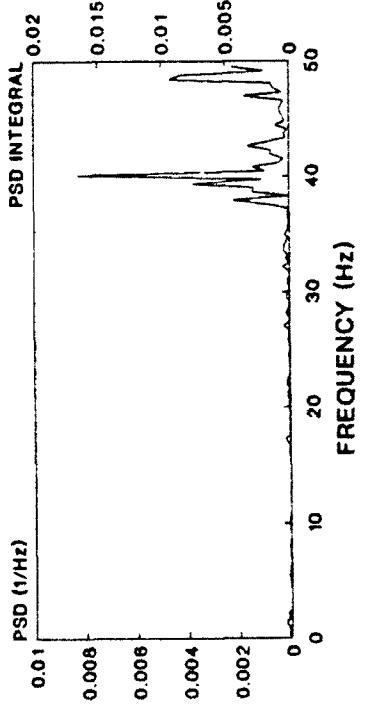
MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



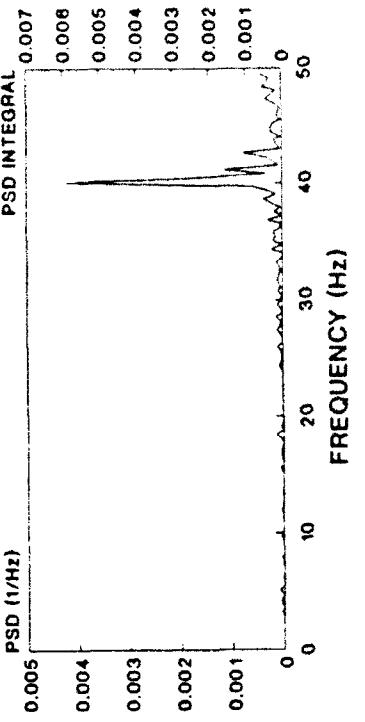
MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



DATA REPORT

SHAPE:	CUBE (ROUNDED)
DECLINATION [THETA (degrees)]:	30
DIMENSIONS [LxWxH (in)]:	9.0 x 8.0 x 8.9
WEIGHT (gm):	1575.4
TORSION FREQUENCY (Hz):	36
LATERAL (SIDE BEND) FREQUENCY (Hz):	61
NORMAL (AFT BEND) FREQUENCY (Hz):	74
AZIMUTHS (degrees):	0, 30, 45, 60, 90, 120, 135, 150, 180

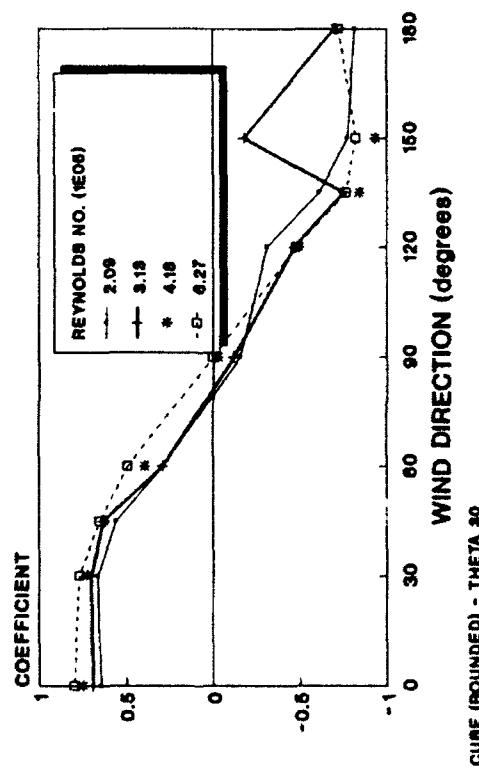
GRAPH CORRECTIONS:

- The mean value of the **ROLL** moment coefficients should be divided by 12.
- The PSD and PSD Integral values of the **ROLL** moment coefficients should be divided by 144.

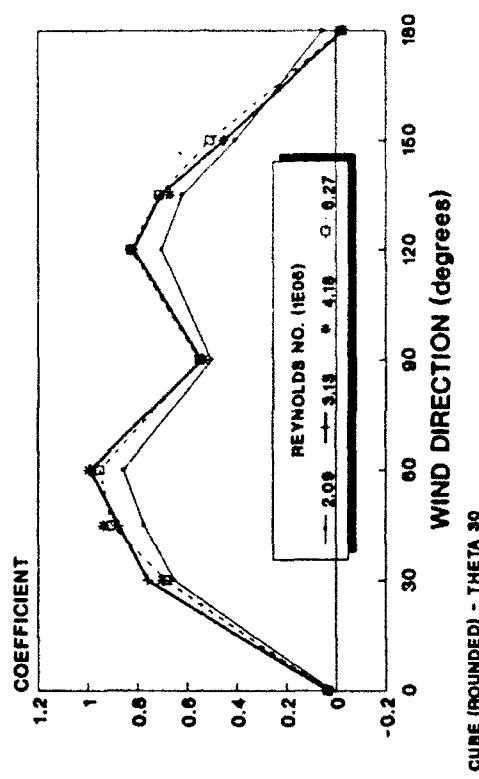
OBSERVATIONS:

- Very good shedding seen in the data at 135 degrees azimuth.
- Good shedding can be seen in the lateral data at 45 degrees azimuth, and in the normal, lateral, and roll data at 120 and 150 degrees azimuth.
- Poor shedding is seen in the data at 30 degrees.
- In comparison to the sharp edged cube at 30 degrees declination, it appears that rounded edges seem to reduce the shedding.

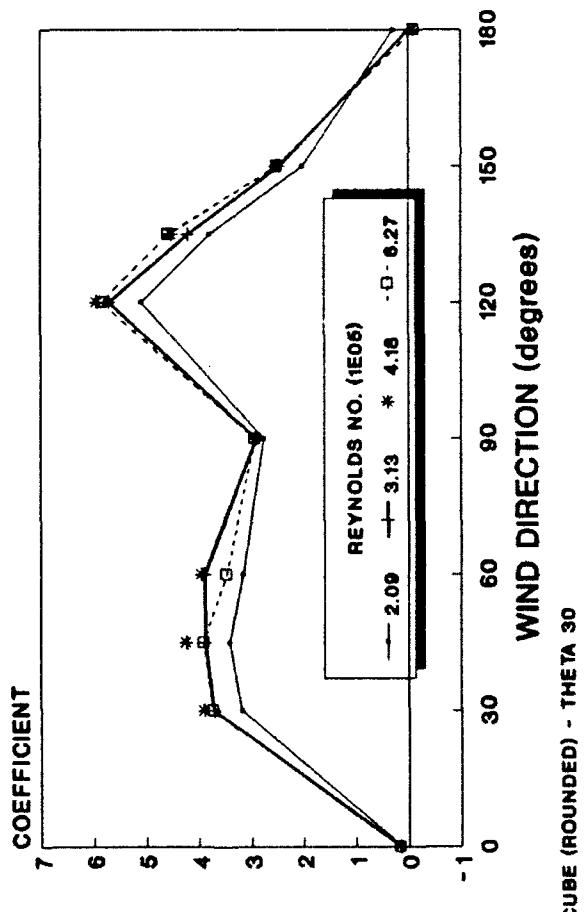
MEAN FORCE COEFFICIENT
NORMAL DIRECTION



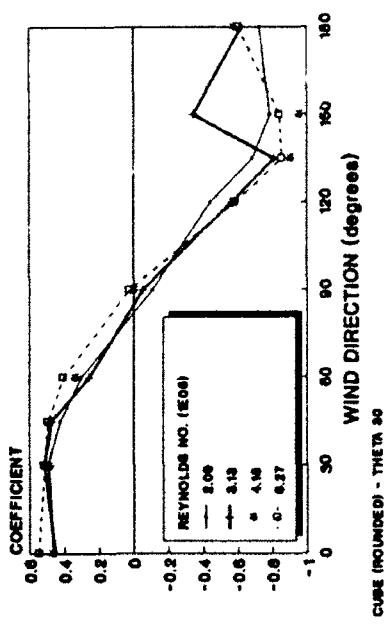
MEAN FORCE COEFFICIENT
LATERAL DIRECTION



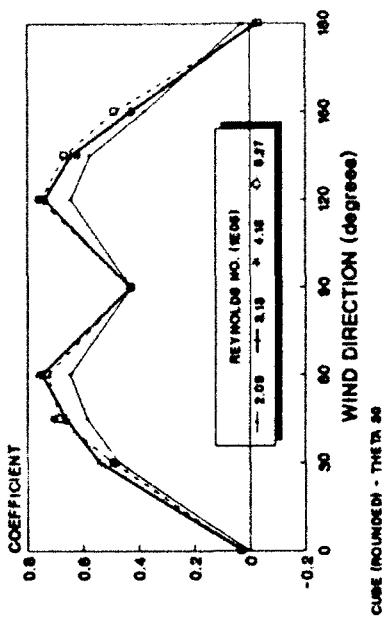
MEAN MOMENT COEFFICIENT ROLL DIRECTION



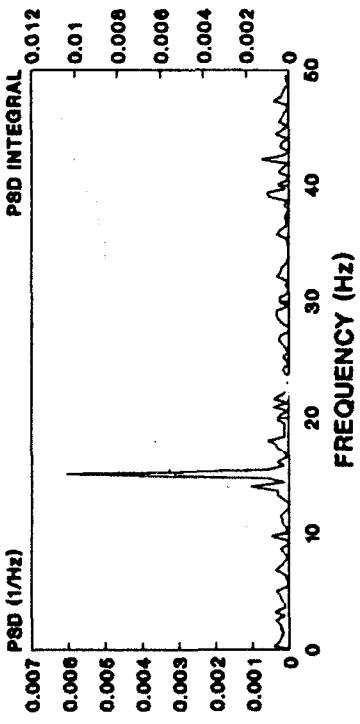
MEAN MOMENT COEFFICIENT NORMAL DIRECTION



MEAN MOMENT COEFFICIENT LATERAL DIRECTION

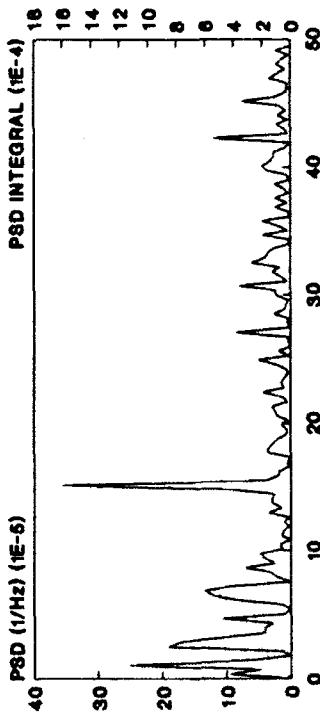


FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



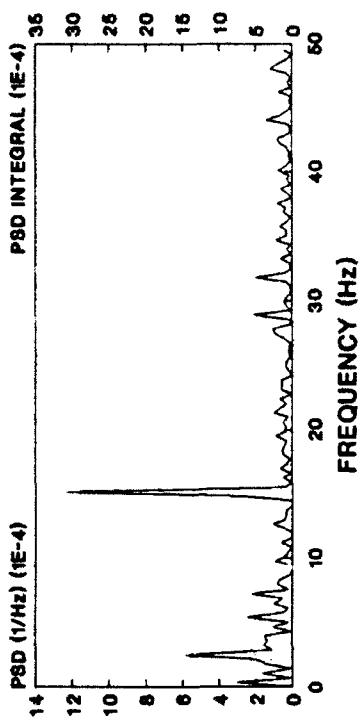
CUBE (R) - HT 6.0 - THETA 30 - AZ 000

FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



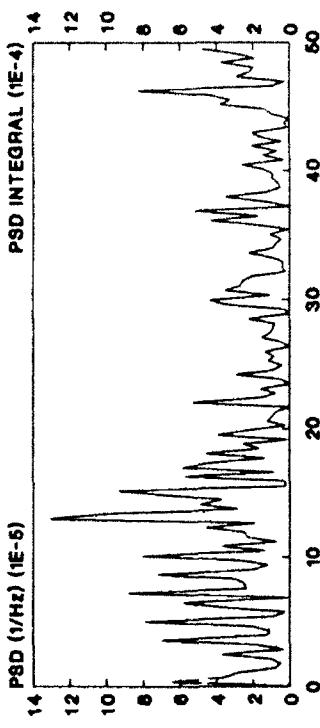
CUBE (R) - HT 6.0 - THETA 30 - AZ 000

FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



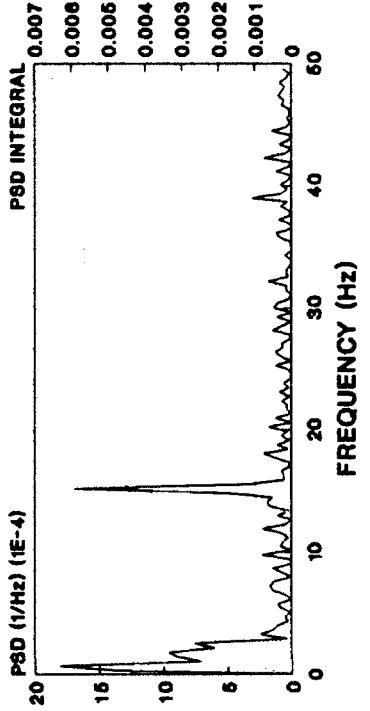
CUBE (R) - HT 6.0 - THETA 30 - AZ 000

FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



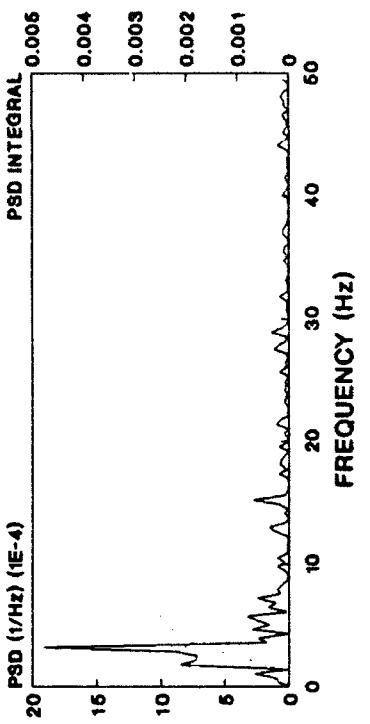
CUBE (R) - HT 6.0 - THETA 30 - AZ 000

MOMENT COEFF - NORMAL 60 FT/SEC NOMINAL



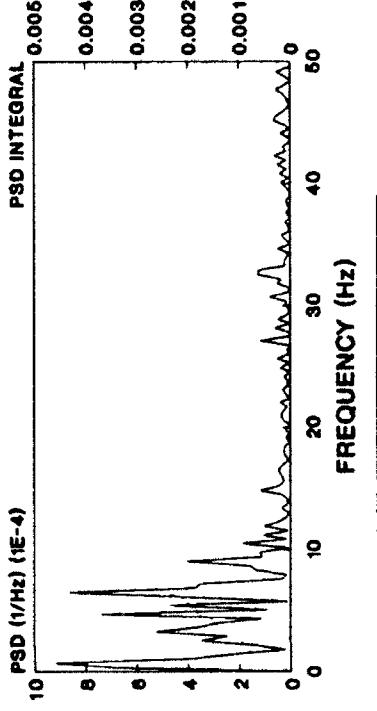
CUBE (R) - HT 6.0 - THETA 30 - AZ 000

MOMENT COEFF - NORMAL 90 FT/SEC NOMINAL



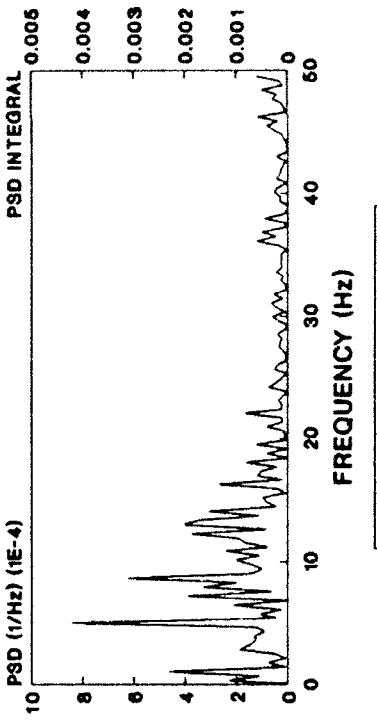
CUBE (R) - HT 6.0 - THETA 30 - AZ 000

MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



CUBE (R) - HT 6.0 - THETA 30 - AZ 000

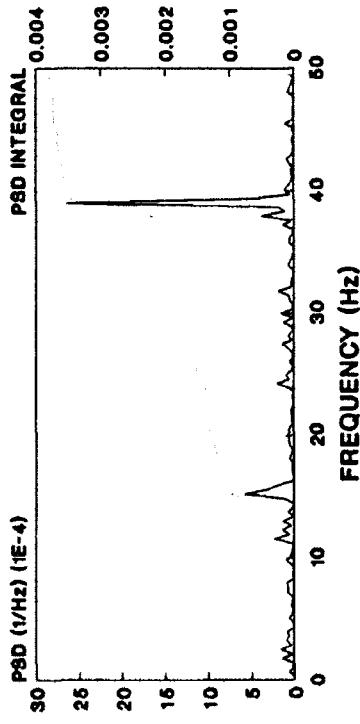
MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL



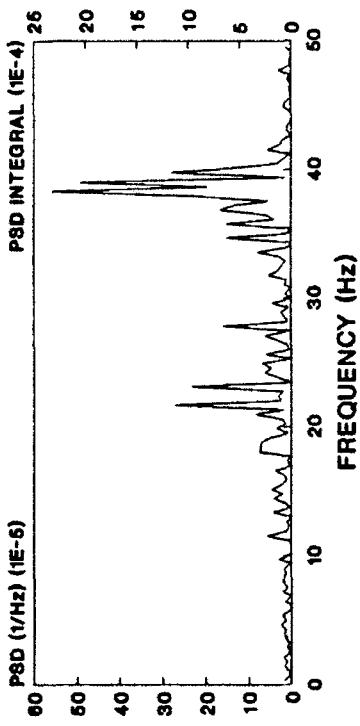
CUBE (R) - HT 6.0 - THETA 30 - AZ 000

CUBE (R) - HT 6.0 - THETA 30 - AZ 000

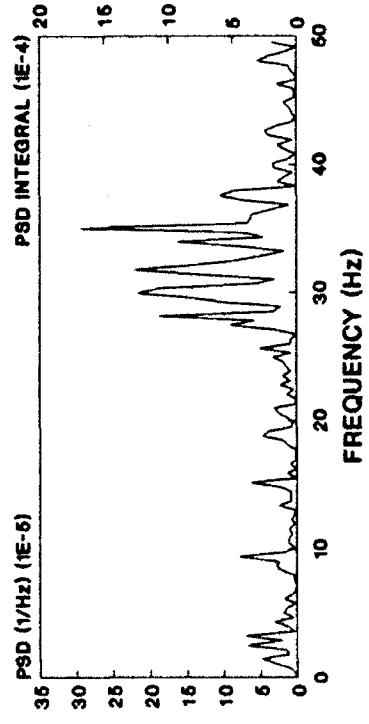
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



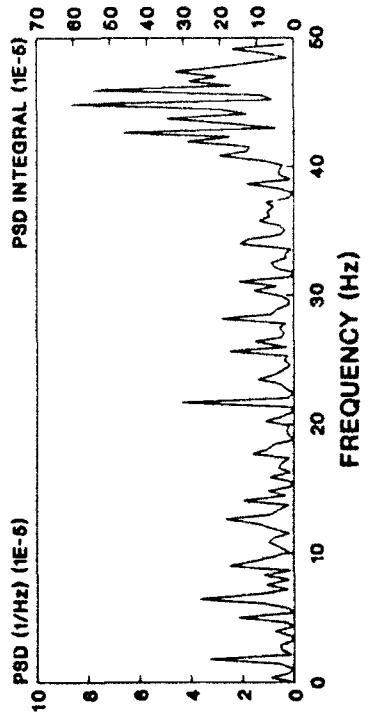
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



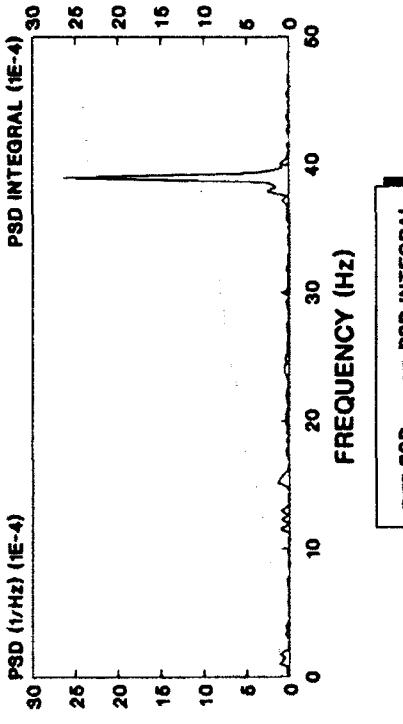
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



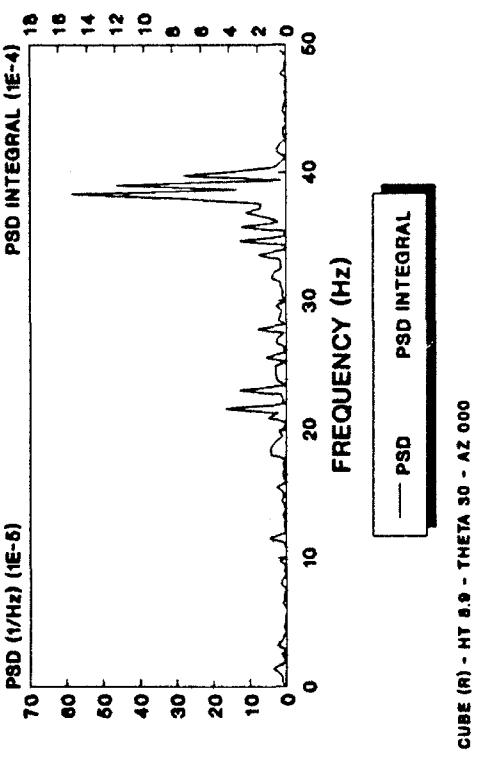
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



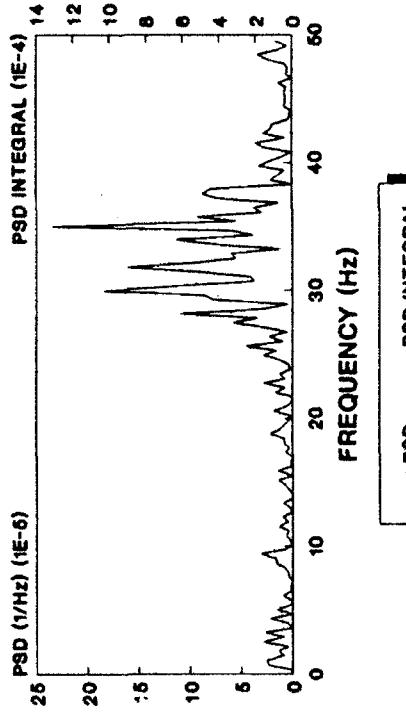
MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



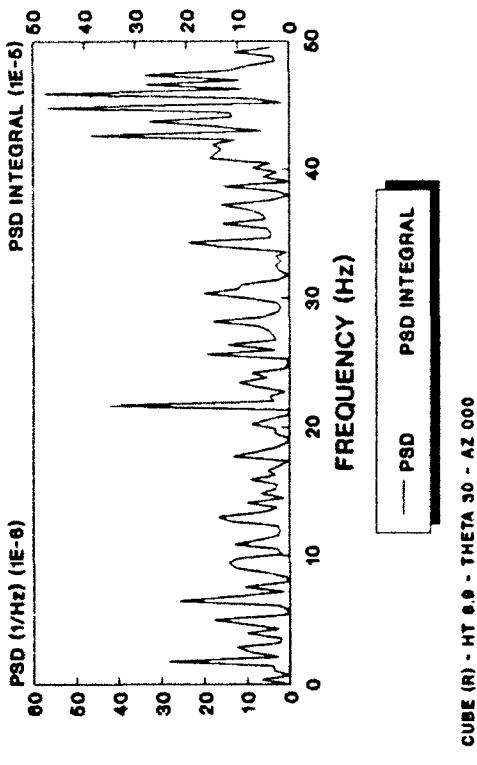
MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



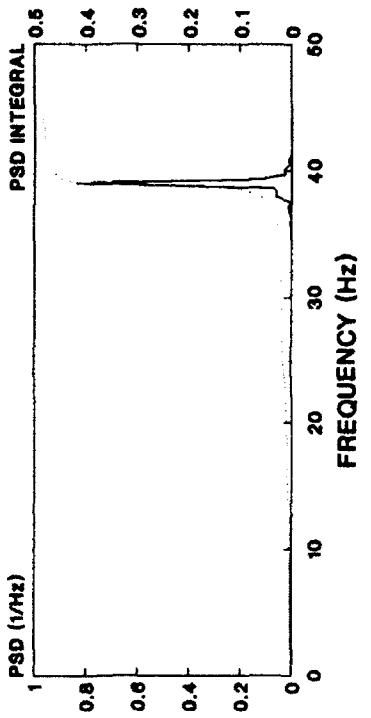
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL

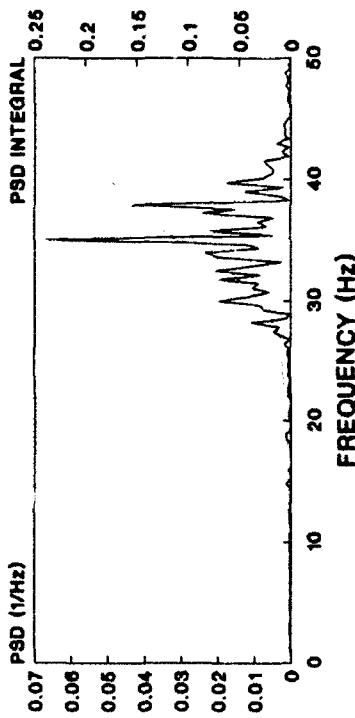


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



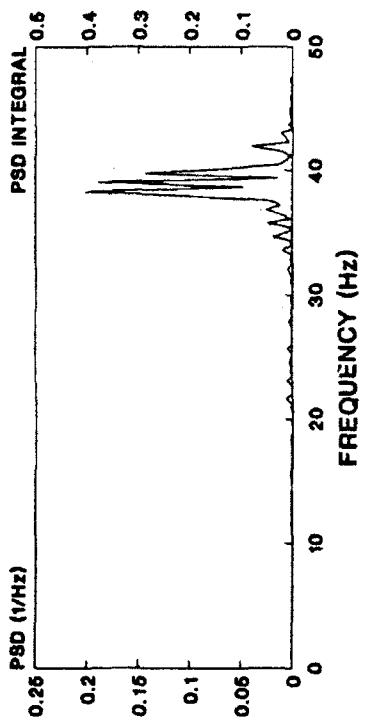
CUBE (R) - HT 6.0 - THETA 30 - AZ 000

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



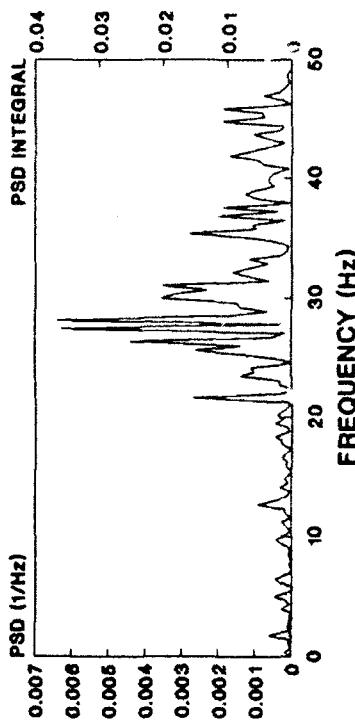
CUBE (R) - HT 6.0 - THETA 30 - AZ 000

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



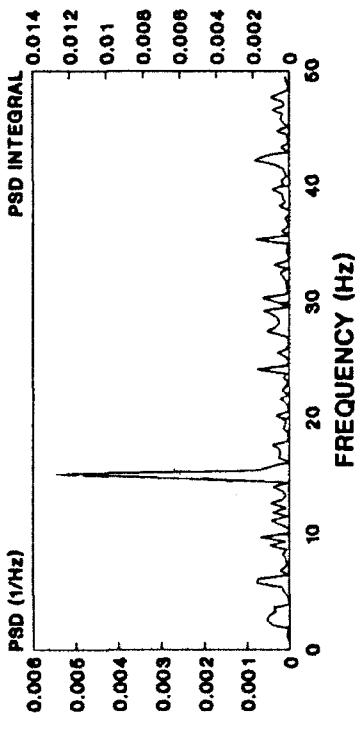
CUBE (R) - HT 6.0 - THETA 30 - AZ 000

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

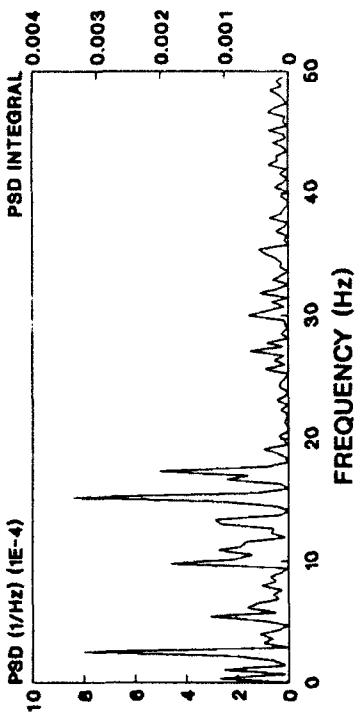


CUBE (R) - HT 6.0 - THETA 30 - AZ 000

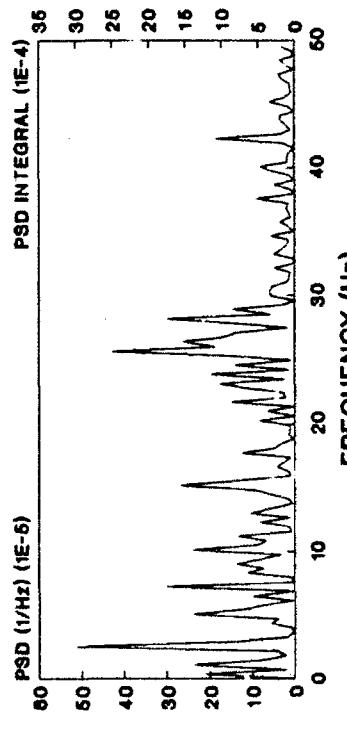
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



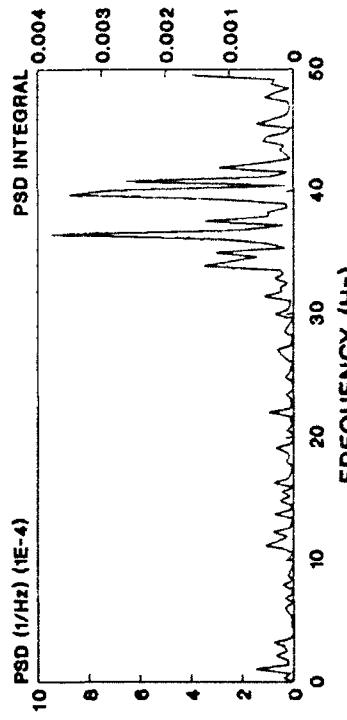
FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



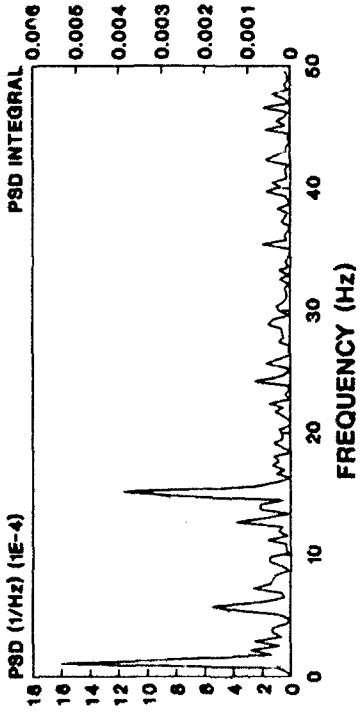
FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



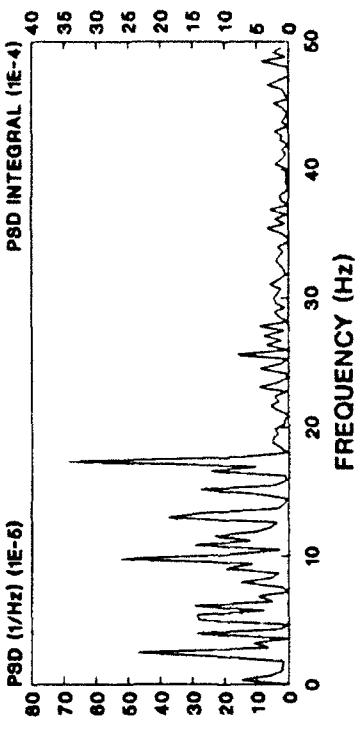
FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



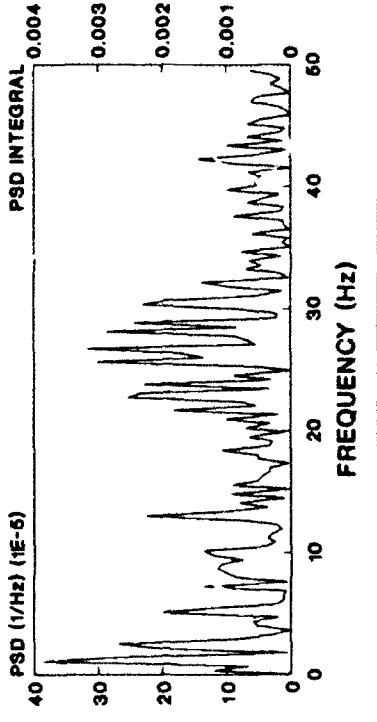
**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



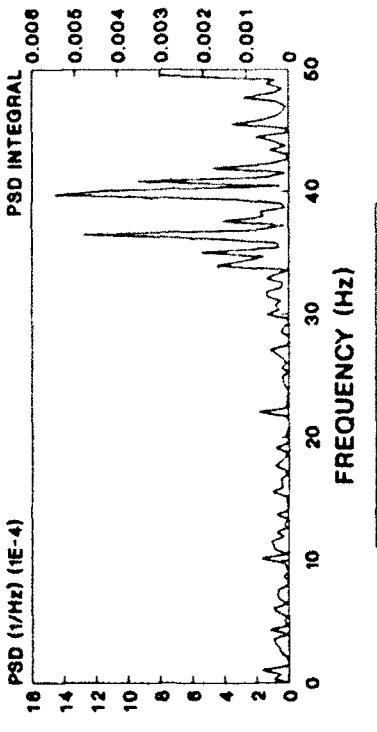
**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



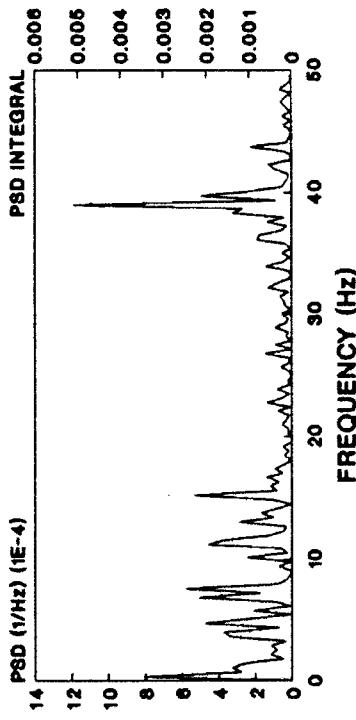
**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**

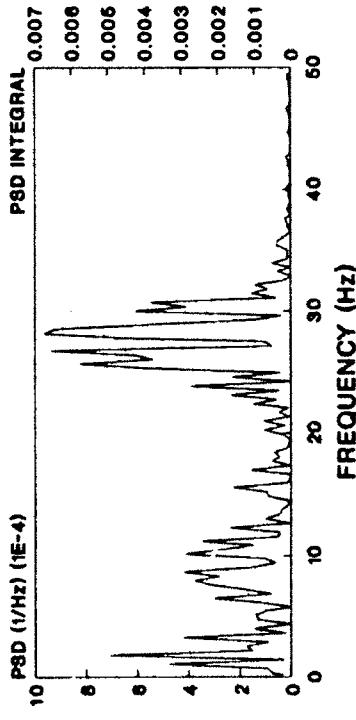


FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



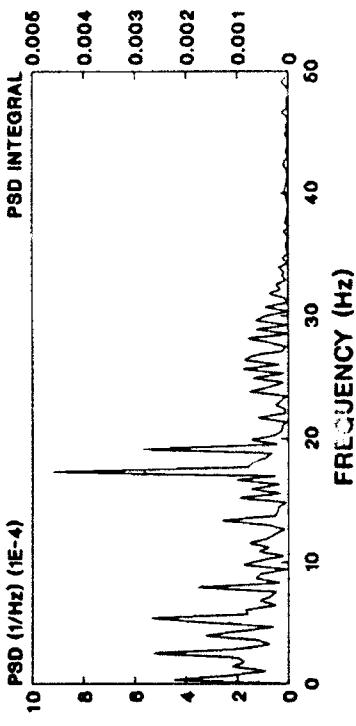
CUBE (R) - HT 8.8 - THETA 30 - AZ 030

FORCE COEFF - LATERAL 120 FT/SEC NOMINAL

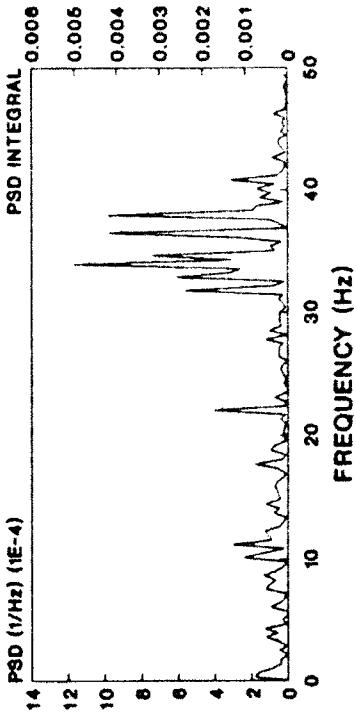


CUBE (R) - HT 8.8 - THETA 30 - AZ 030

FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



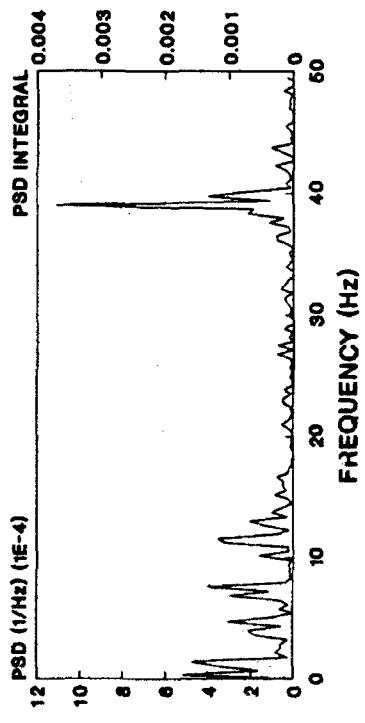
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



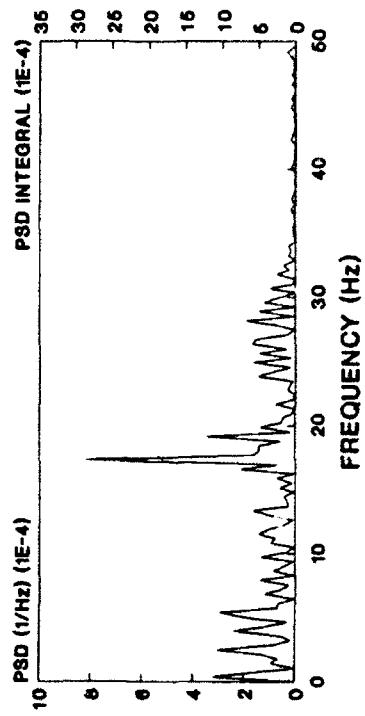
CUBE (R) - HT 8.8 - THETA 30 - AZ 030

CUBE (R) - HT 8.8 - THETA 30 - AZ 030

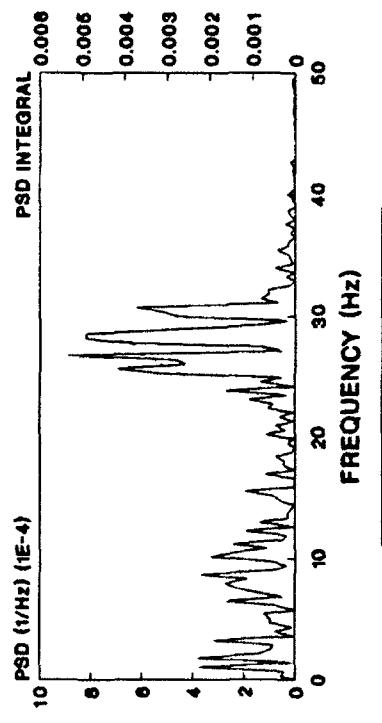
**MOMENT COEFF - LATERAL
60 FT/SEC NOMINAL**



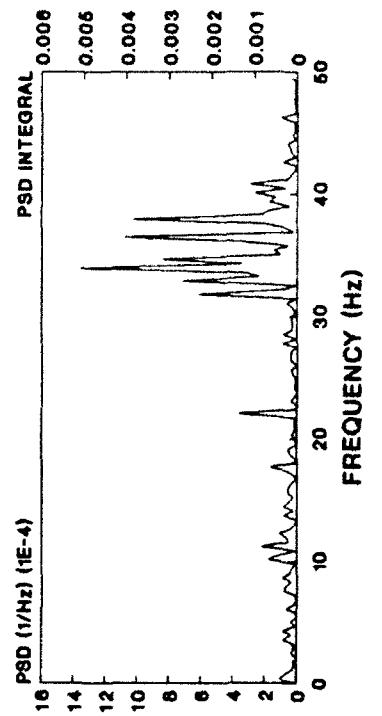
**MOMENT COEFF - LATERAL
90 FT/SEC NOMINAL**



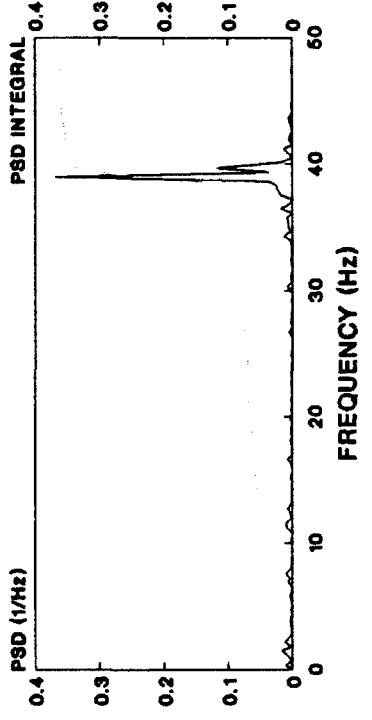
**MOMENT COEFF - LATERAL
120 FT/SEC NOMINAL**



**MOMENT COEFF - LATERAL
180 FT/SEC NOMINAL**

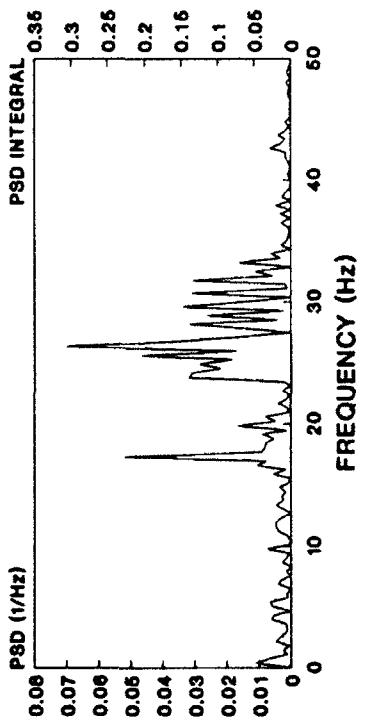


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



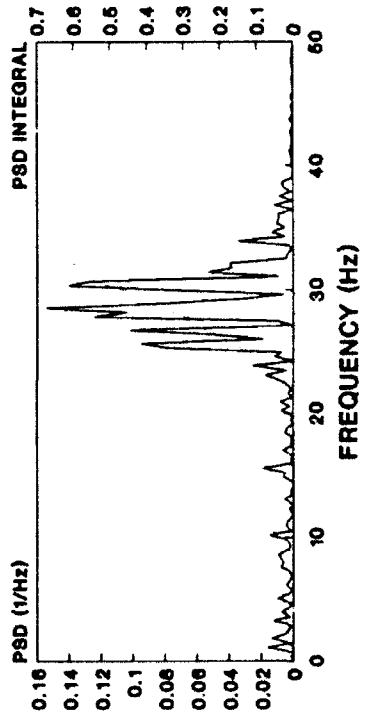
CUBE (R) - HT 8.9 - THETA 30 - AZ 030

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



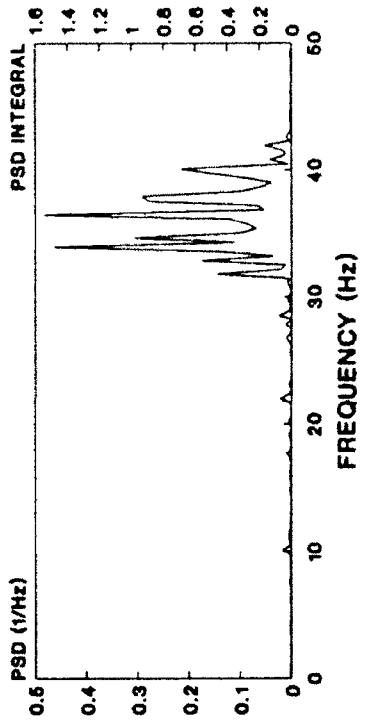
CUBE (R) - HT 8.9 - THETA 30 - AZ 210

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



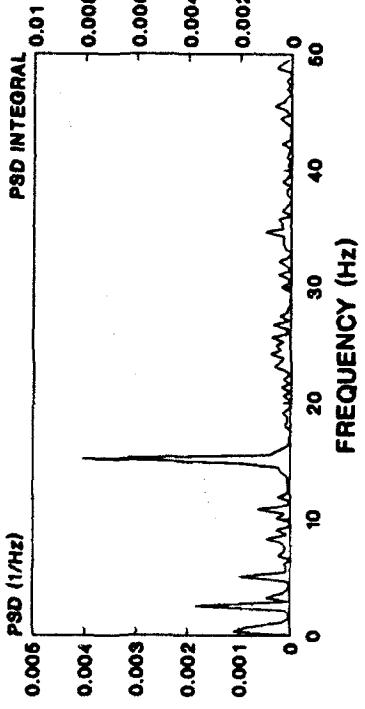
CUBE (R) - HT 8.9 - THETA 30 - AZ 030

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



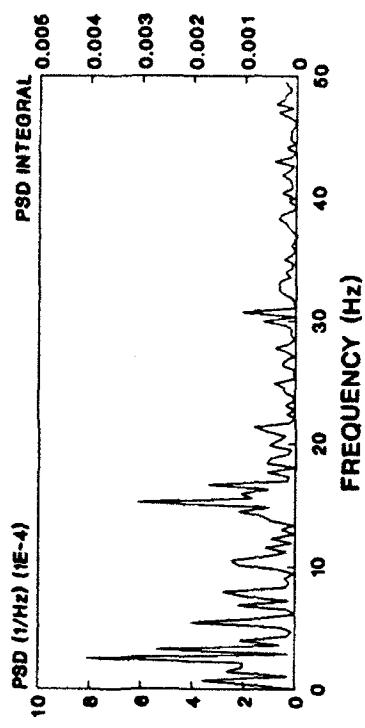
CUBE (R) - HT 8.9 - THETA 30 - AZ 030

FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



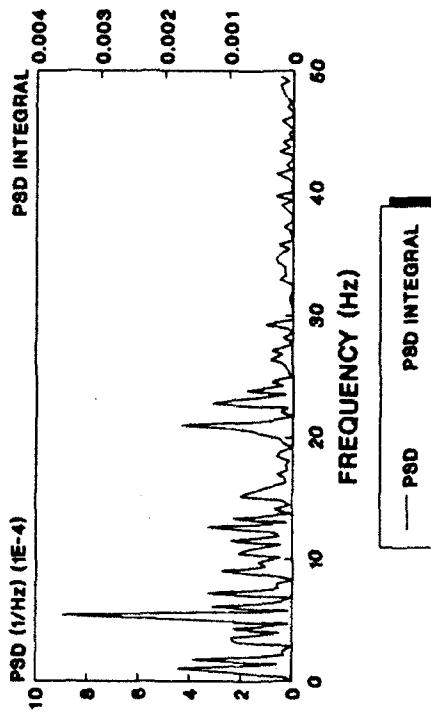
CUBE (R) - HT 6.0 - THETA 30 - AZ 046

FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



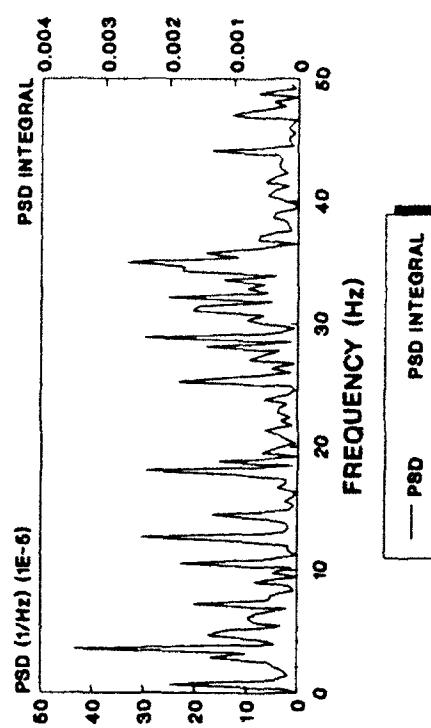
CUBE (R) - HT 6.0 - THETA 30 - AZ 046

FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



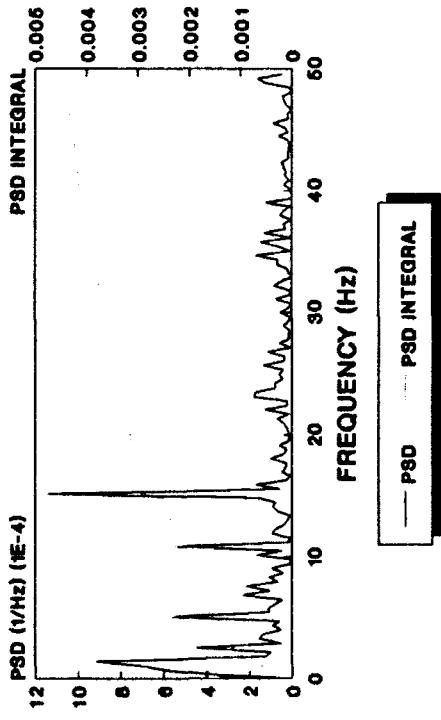
CUBE (R) - HT 6.0 - THETA 30 - AZ 046

FORCE COEFF - NORMAL 180 FT/SEC NOMINAL

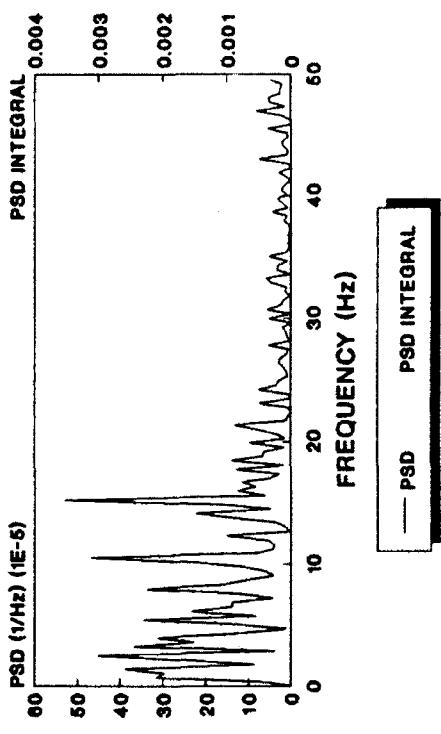


CUBE (R) - HT 6.0 - THETA 30 - AZ 046

MOMENT COEFF - NORMAL 60 FT/SEC NOMINAL

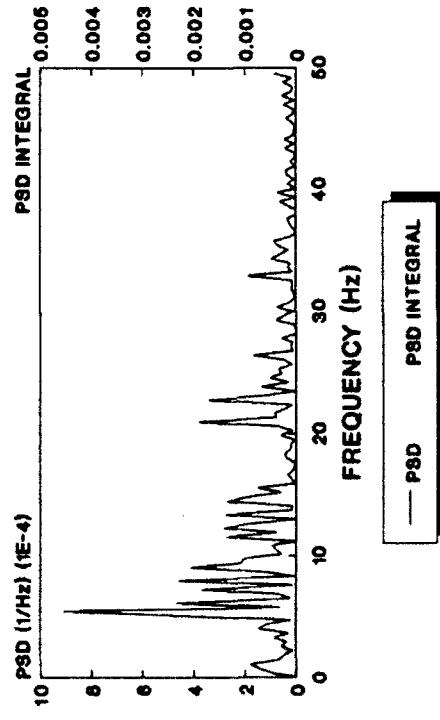


MOMENT COEFF - NORMAL 90 FT/SEC NOMINAL

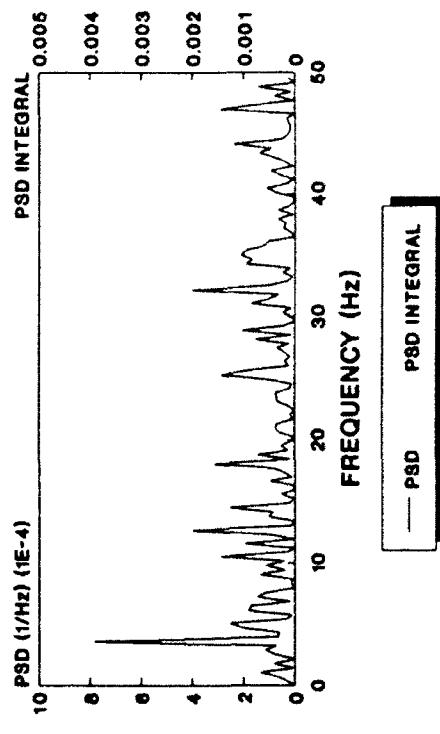


CUBE (R) - HT 8.0 - THETA 30 - AZ 046

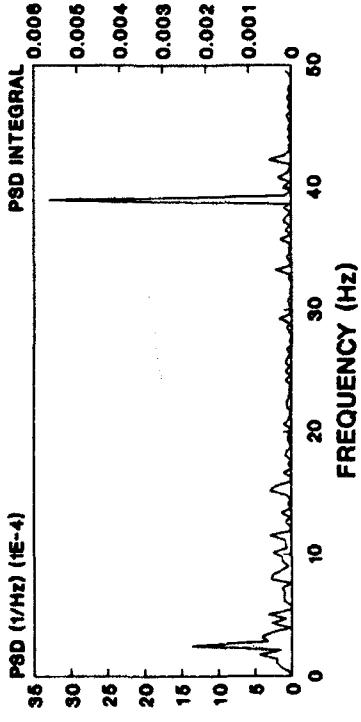
MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL

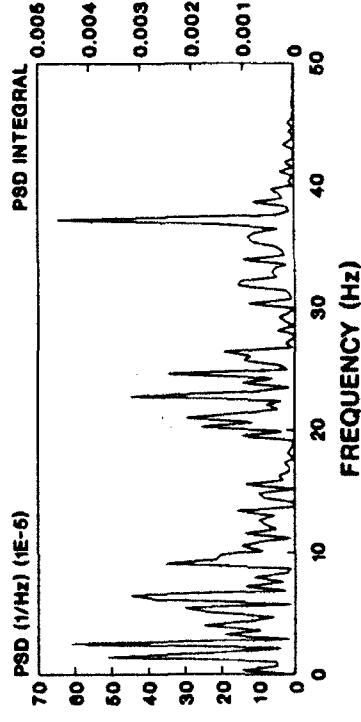


FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



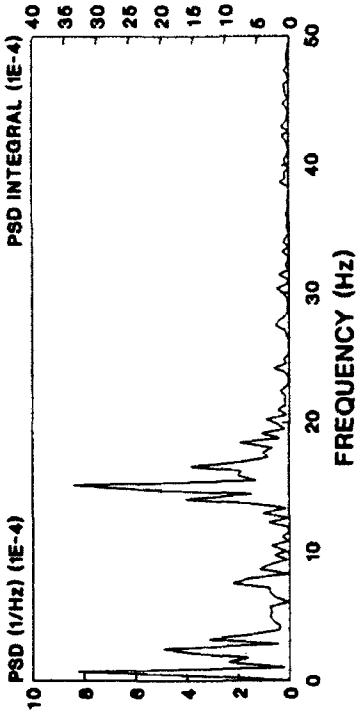
CUBE (R) - HT 8.9 - THETA 30 - AZ 046

FORCE COEFF - LATERAL 120 FT/SEC NOMINAL

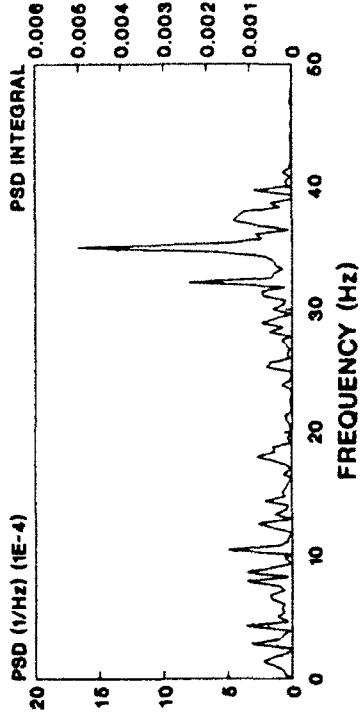


CUBE (R) - HT 8.9 - THETA 30 - AZ 046

FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



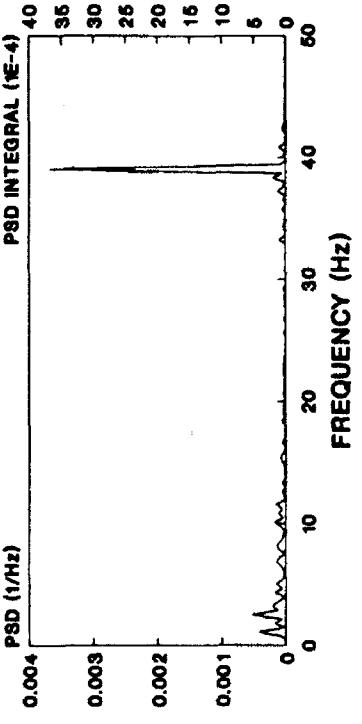
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



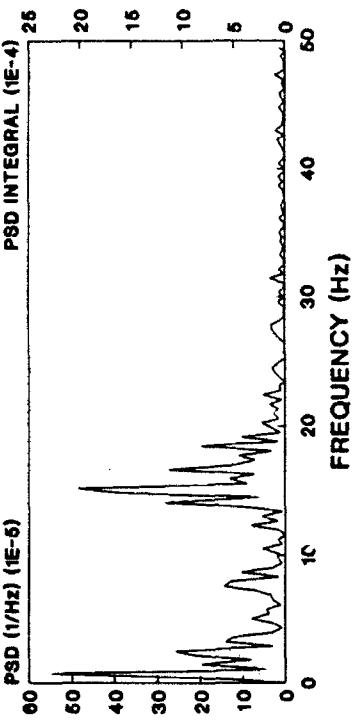
CUBE (R) - HT 8.9 - THETA 30 - AZ 046

CUBE (R) - HT 8.9 - THETA 30 - AZ 046

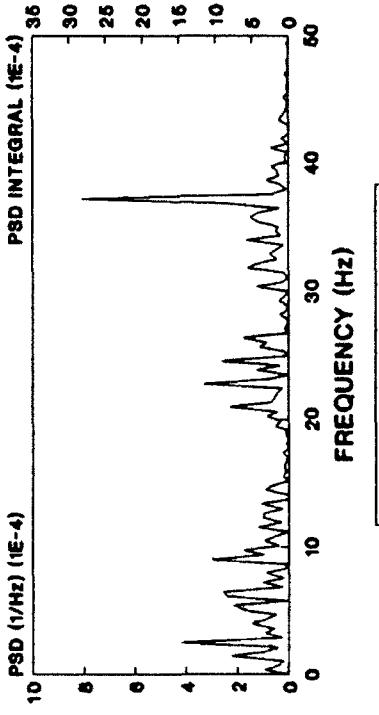
MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



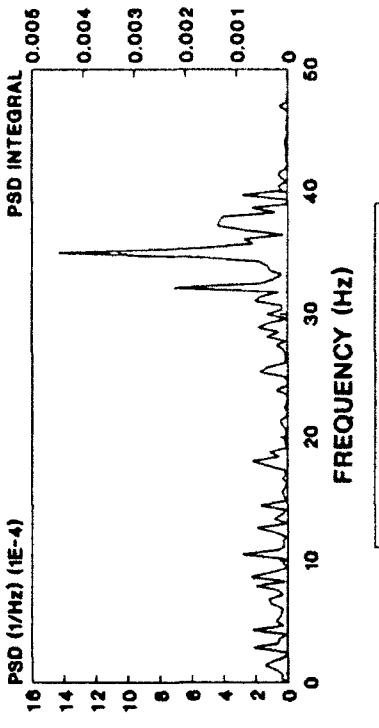
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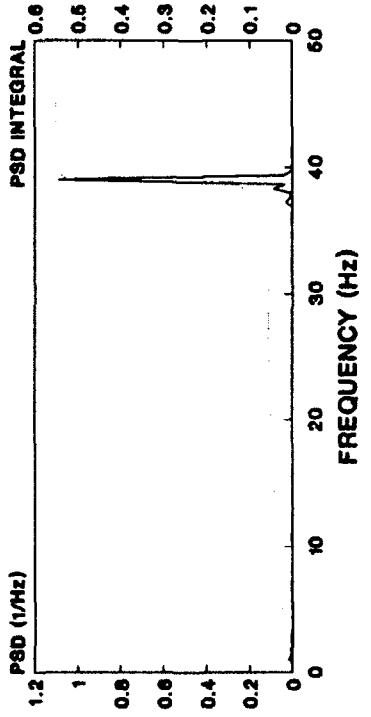
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL

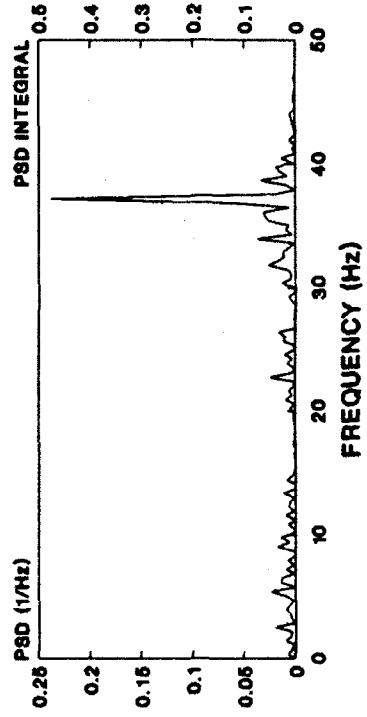


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



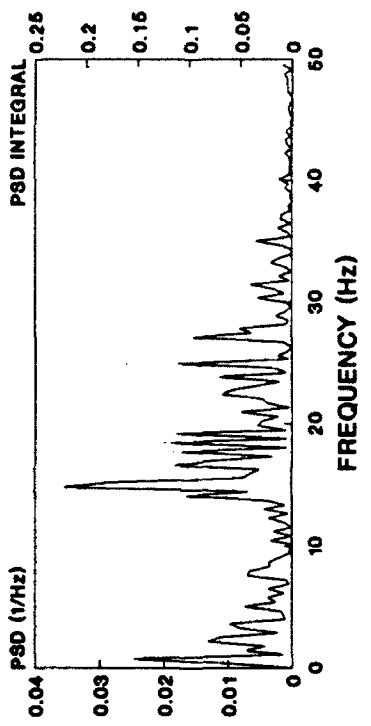
CUBE (R) - HT 8.9 - THETA 30 - AZ 045

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



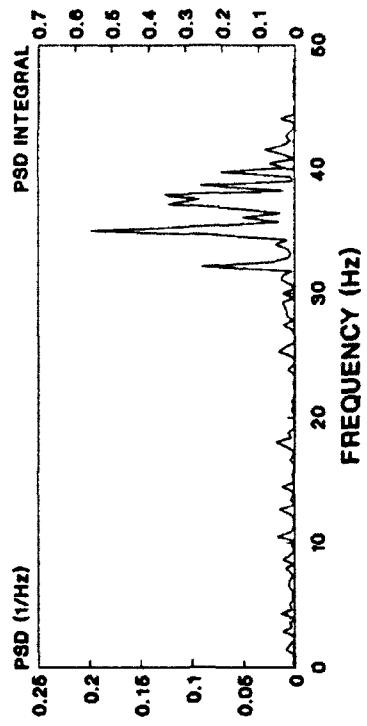
CUBE (R) - HT 8.9 - THETA 30 - AZ 045

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



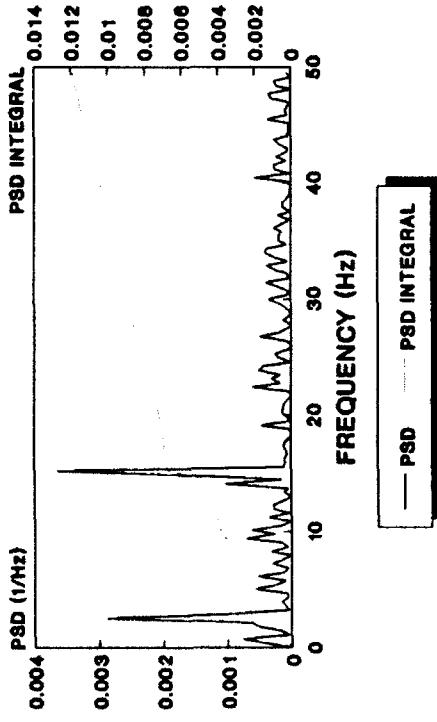
CUBE (R) - HT 8.9 - THETA 30 - AZ 045

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

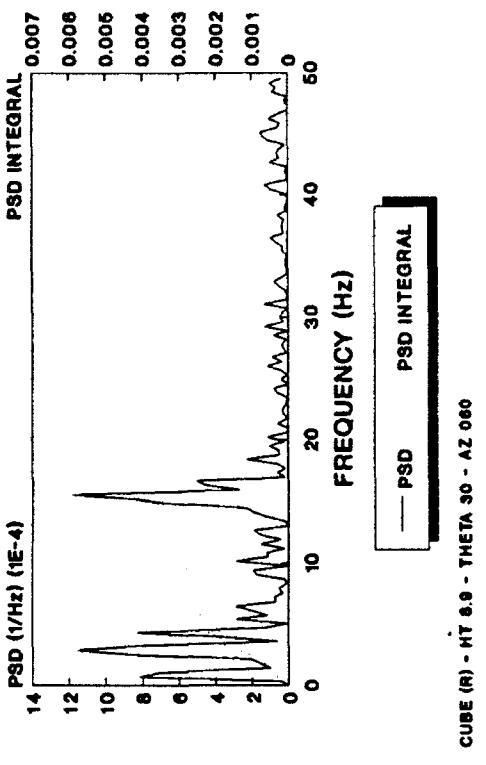


CUBE (R) - HT 8.9 - THETA 30 - AZ 045

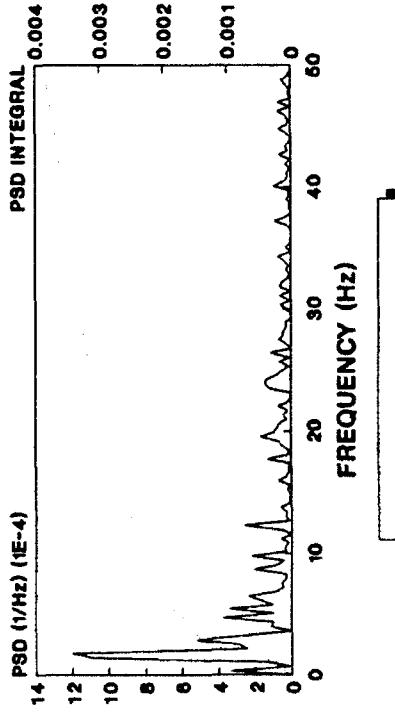
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



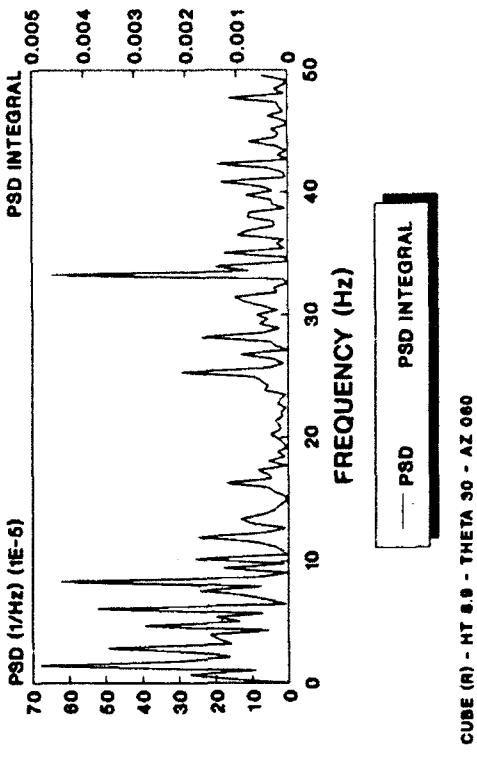
FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



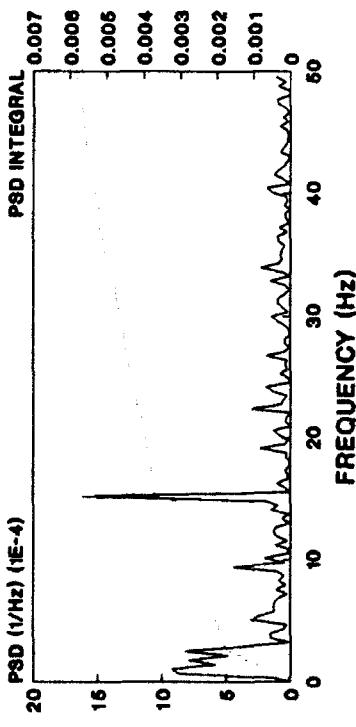
FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



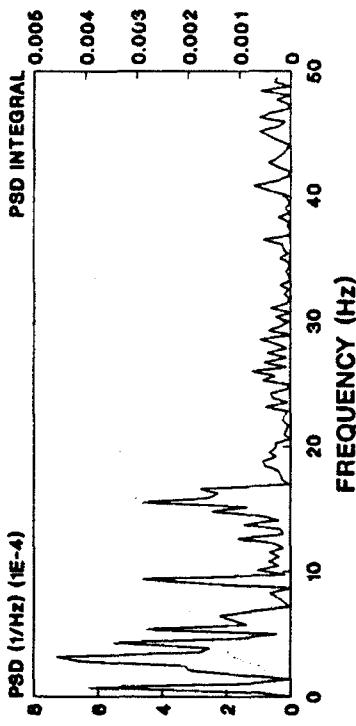
FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



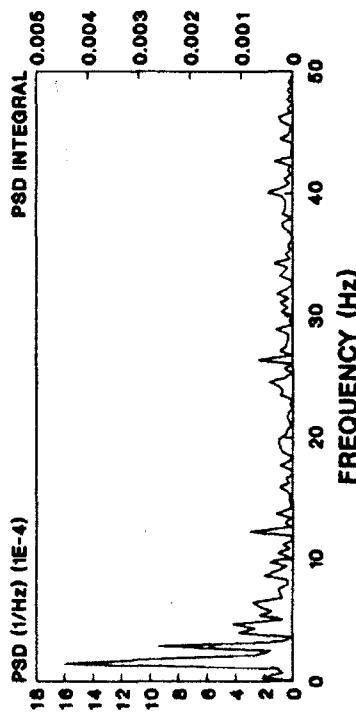
**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



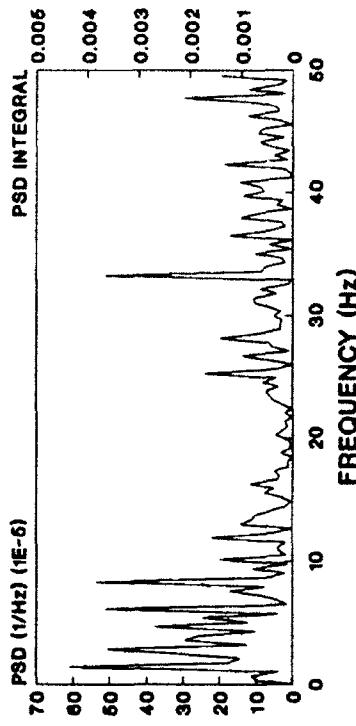
**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



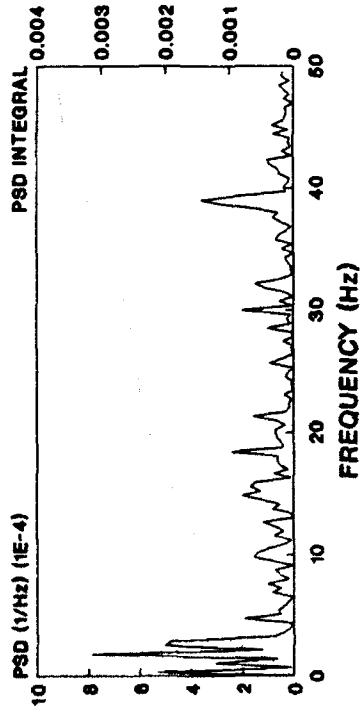
**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**

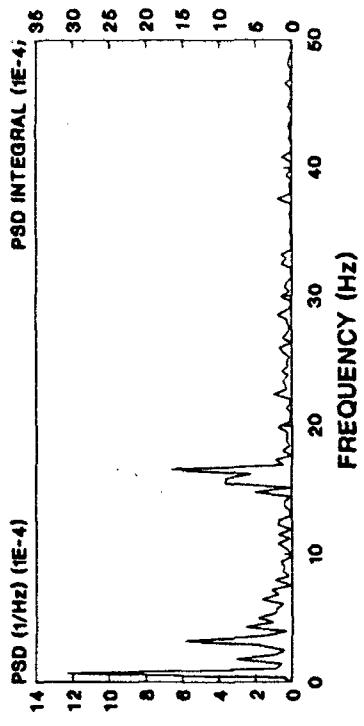


FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



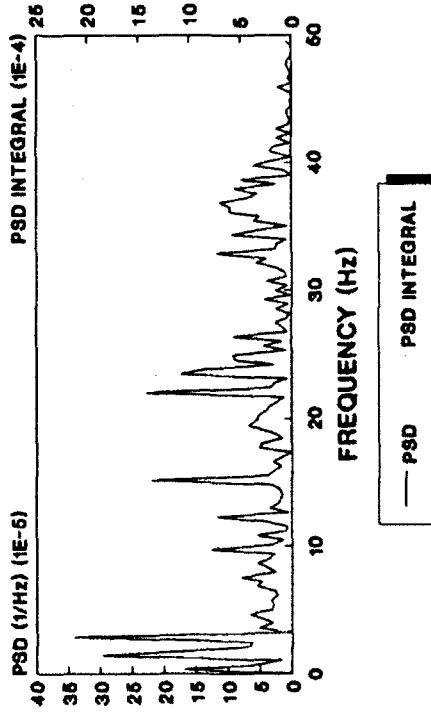
CUBE (R) - HT 8.9 - THETA 30 - AZ 060

FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



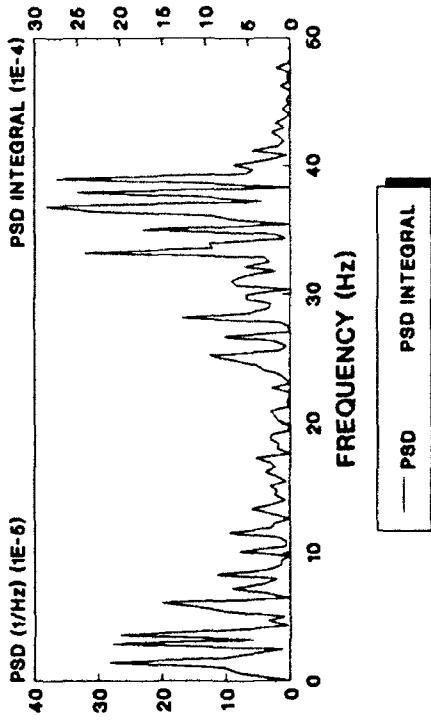
CUBE (R) - HT 8.9 - THETA 30 - AZ 060

FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



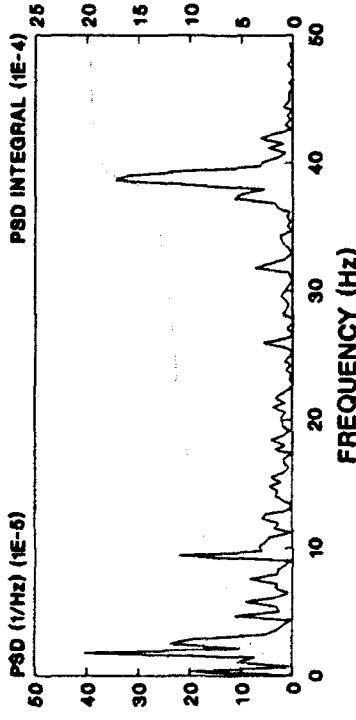
CUBE (R) - HT 8.9 - THETA 30 - AZ 060

FORCE COEFF - LATERAL 180 FT/SEC NOMINAL

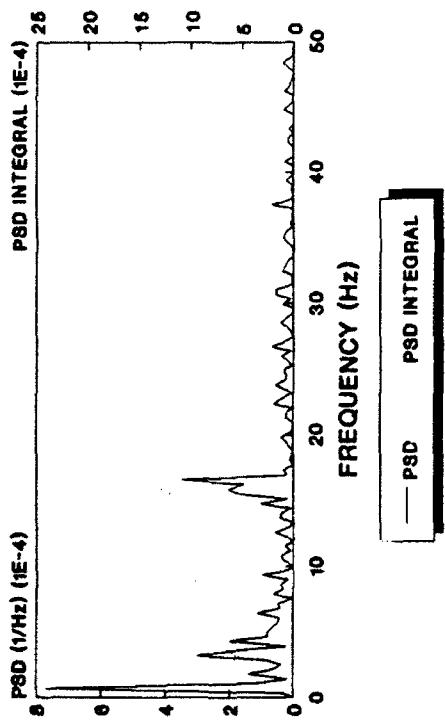


CUBE (R) - HT 8.9 - THETA 30 - AZ 060

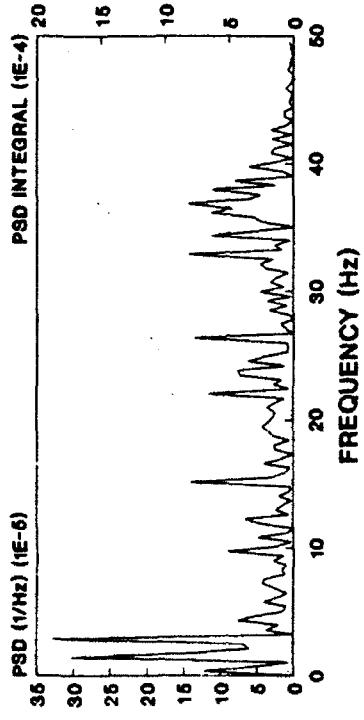
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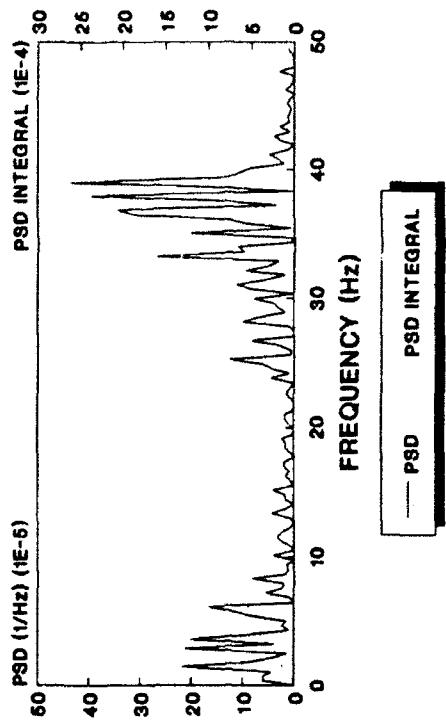
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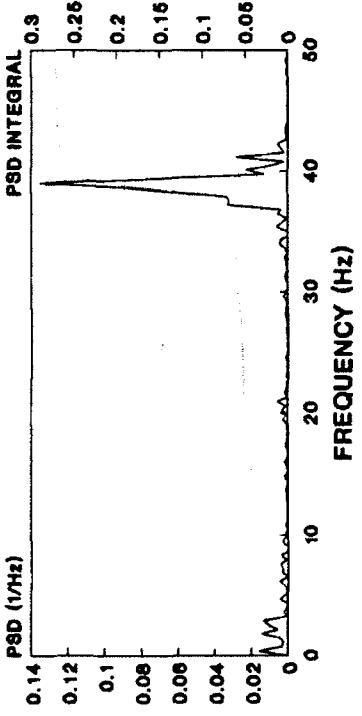
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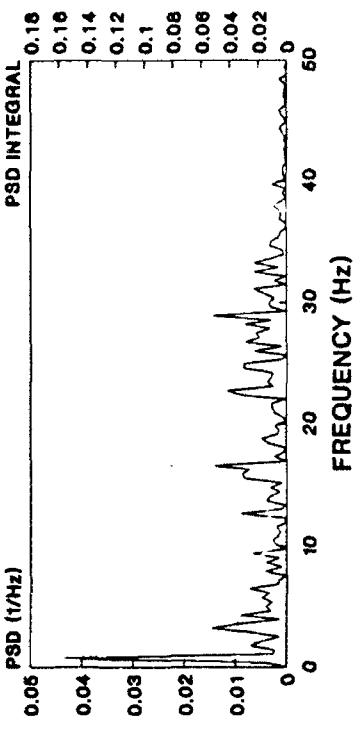
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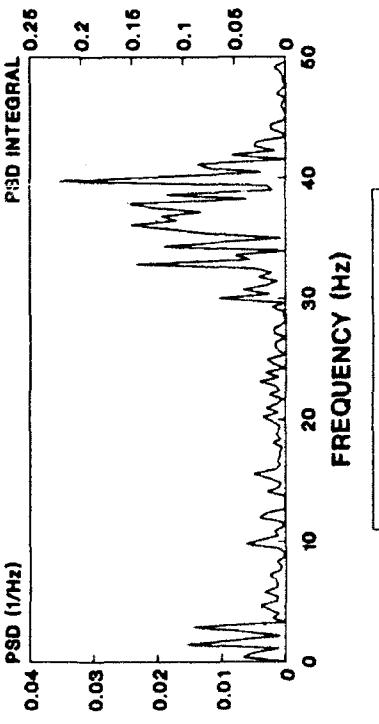
MOMENT COEFF - ROLL
60 FT/SEC NOMINAL



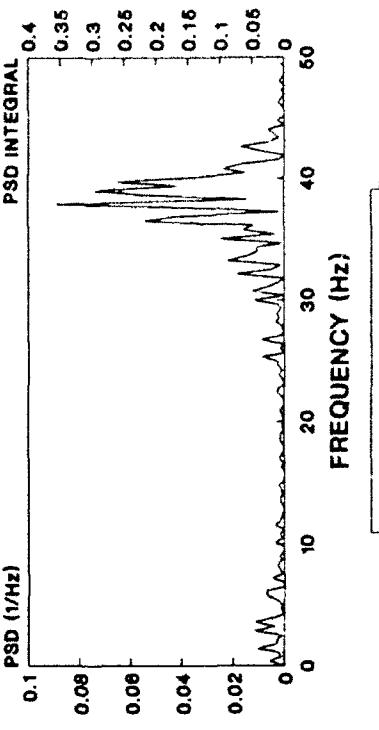
MOMENT COEFF - ROLL
90 FT/SEC NOMINAL



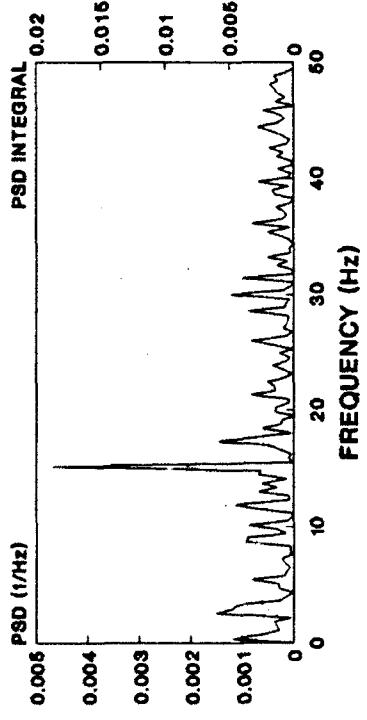
MOMENT COEFF - ROLL
120 FT/SEC NOMINAL



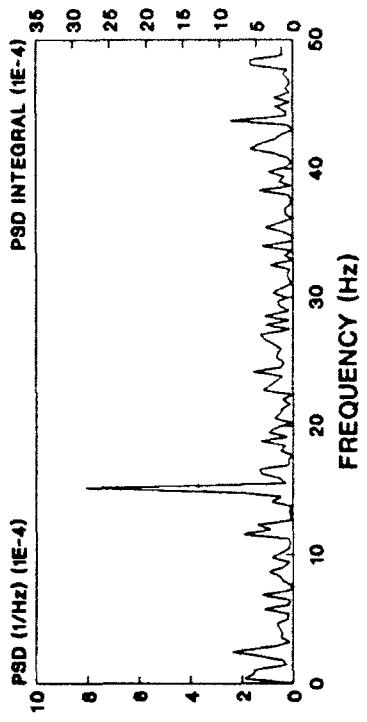
MOMENT COEFF - ROLL
180 FT/SEC NOMINAL



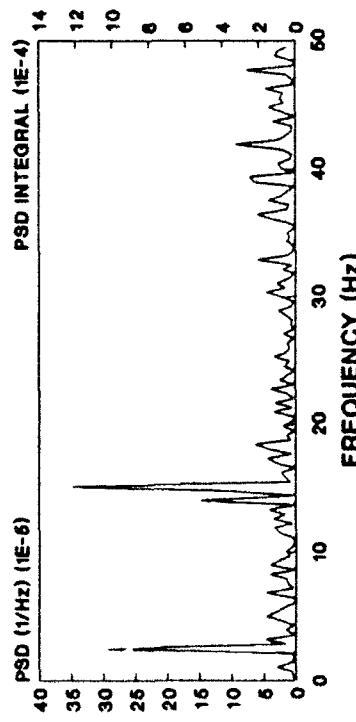
**FORCE COEFF - NORMAL
60 FT/SEC NOMINAL**



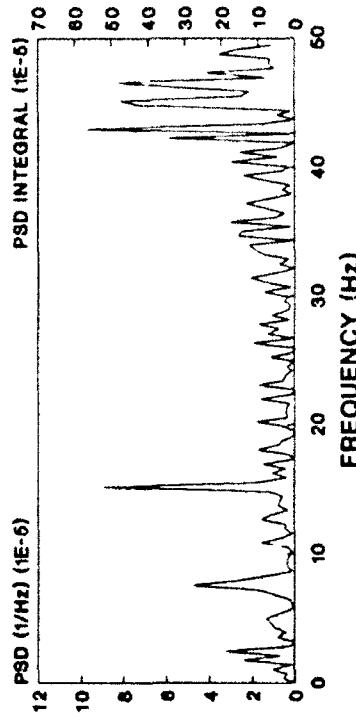
**FORCE COEFF - NORMAL
90 FT/SEC NOMINAL**



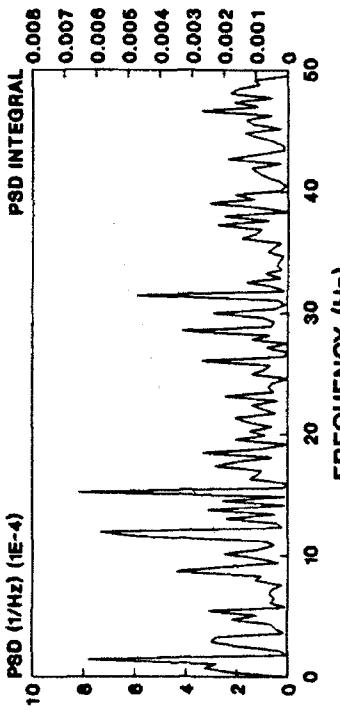
**FORCE COEFF - NORMAL
120 FT/SEC NOMINAL**



**FORCE COEFF - NORMAL
180 FT/SEC NOMINAL**

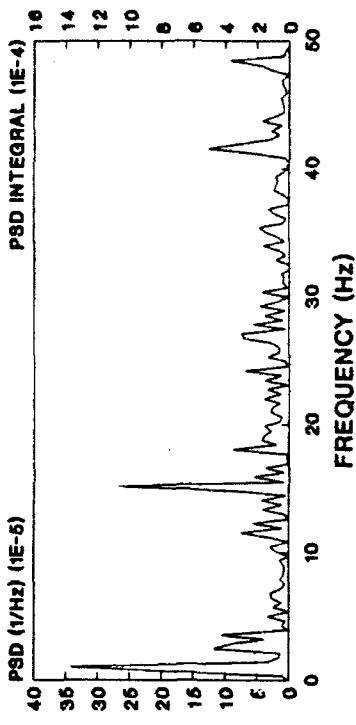


**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



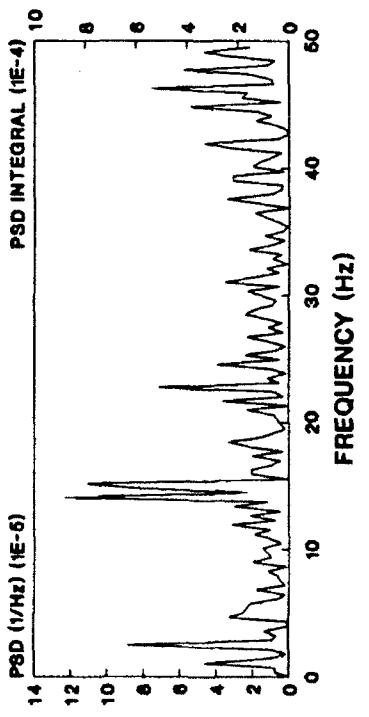
CUBE (R) - HT 6.0 - THETA 30 - AZ 090

**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



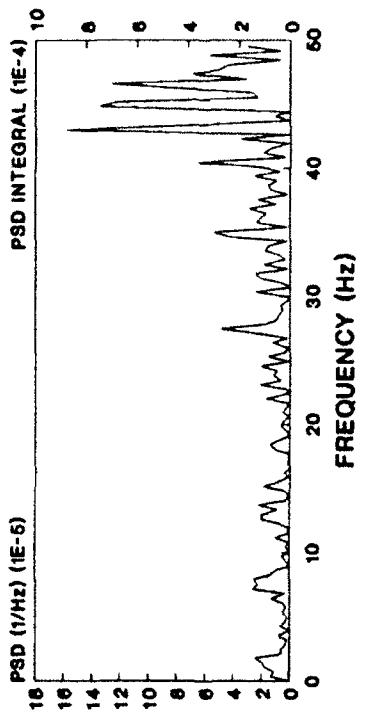
CUBE (R) - HT 6.0 - THETA 30 - AZ 090

**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



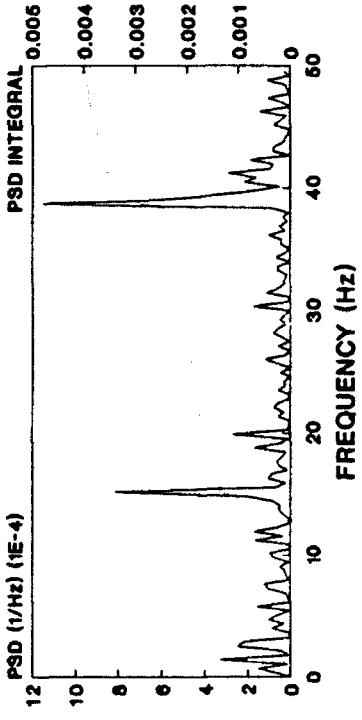
CUBE (R) - HT 6.0 - THETA 30 - AZ 090

**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



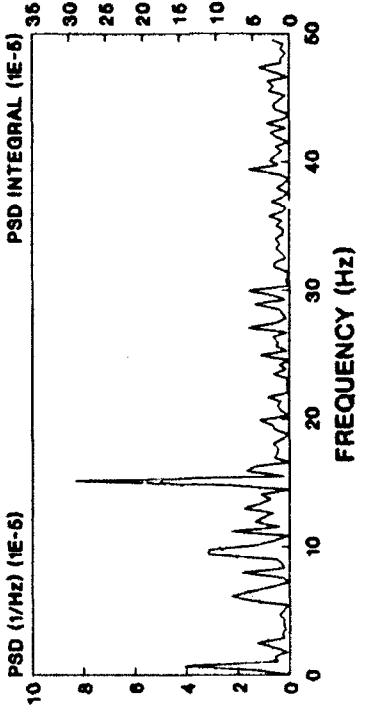
CUBE (R) - HT 6.0 - THETA 30 - AZ 090

FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



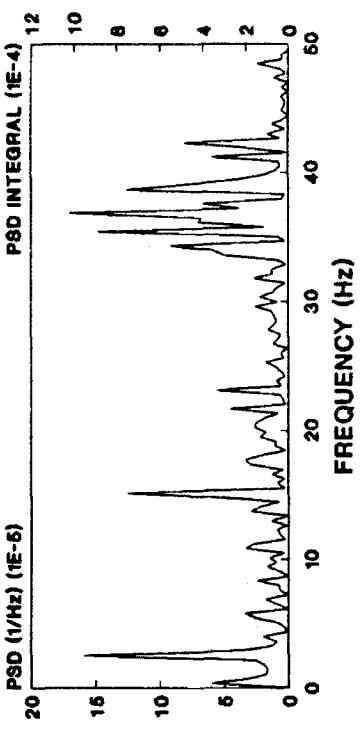
CUBE (R) - HT 6.0 - THETA 30 - AZ 000

FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



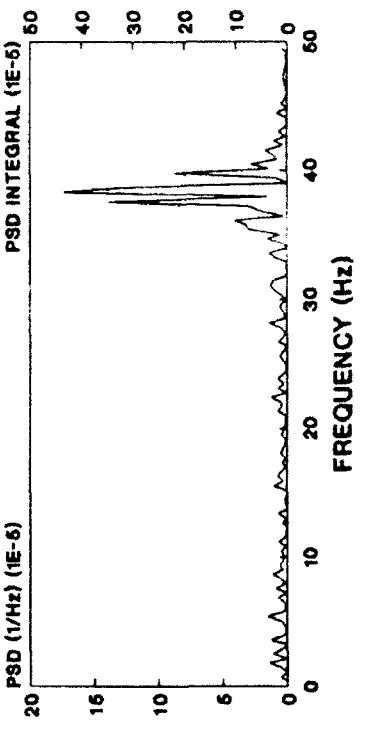
CUBE (R) - HT 6.0 - THETA 30 - AZ 000

FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



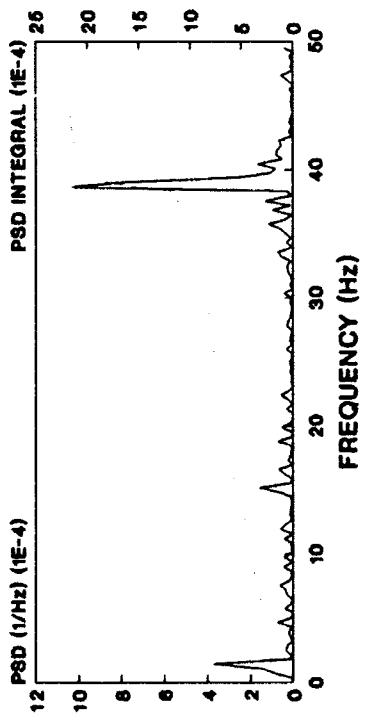
CUBE (R) - HT 6.0 - THETA 30 - AZ 000

FORCE COEFF - LATERAL 180 FT/SEC NOMINAL

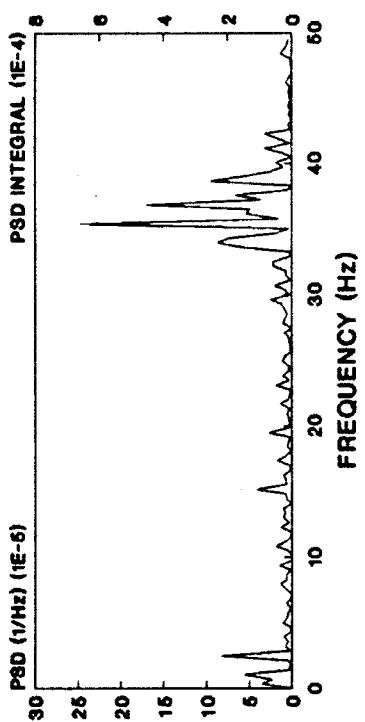


CUBE (R) - HT 6.0 - THETA 30 - AZ 000

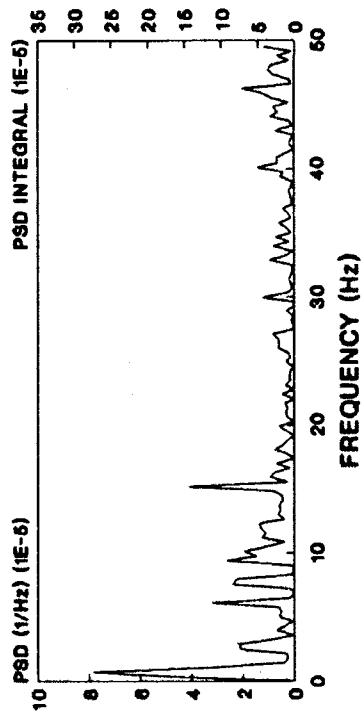
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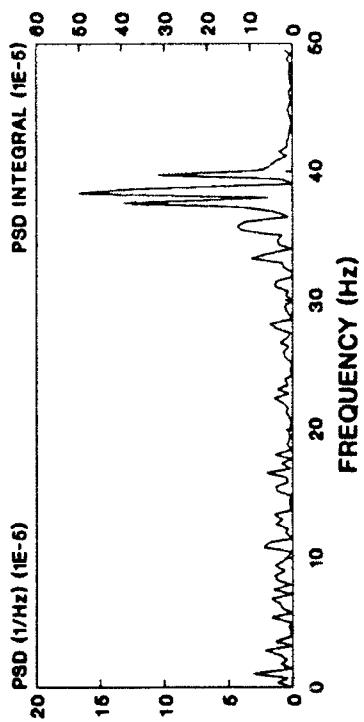
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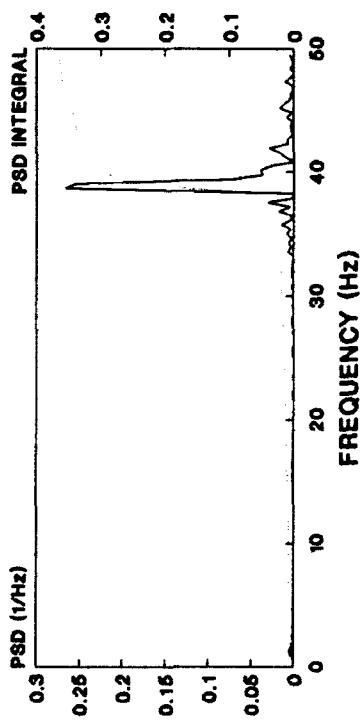
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL



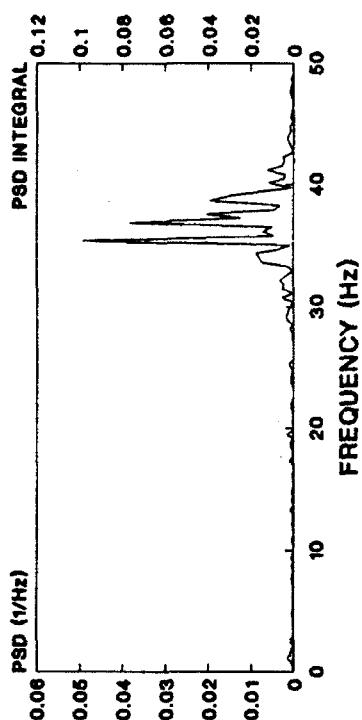
MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



CUBE (R) - HT 8.8 - THETA 30 - AZ 090

— PSD — PSD INTEGRAL

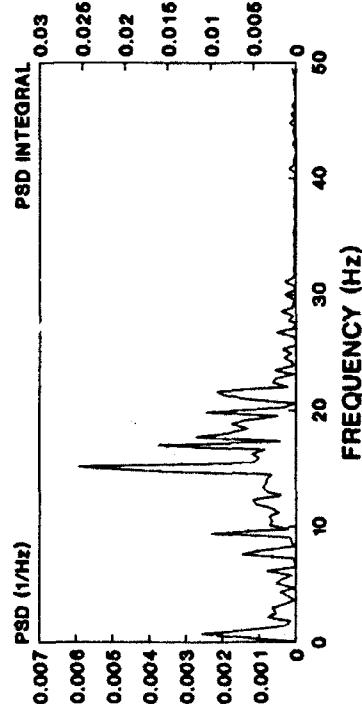
MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



CUBE (R) - HT 8.8 - THETA 30 - AZ 090

— PSD — PSD INTEGRAL

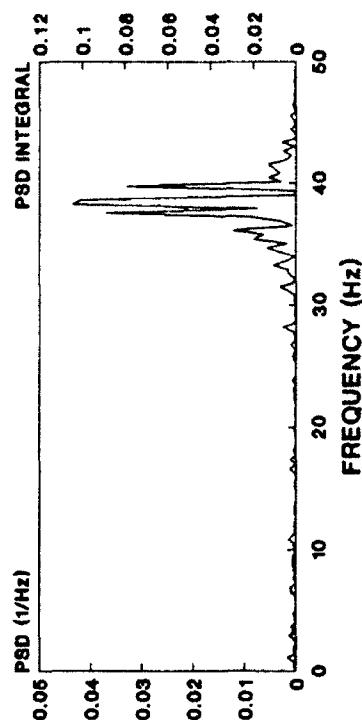
MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



CUBE (R) - HT 8.8 - THETA 30 - AZ 090

— PSD — PSD INTEGRAL

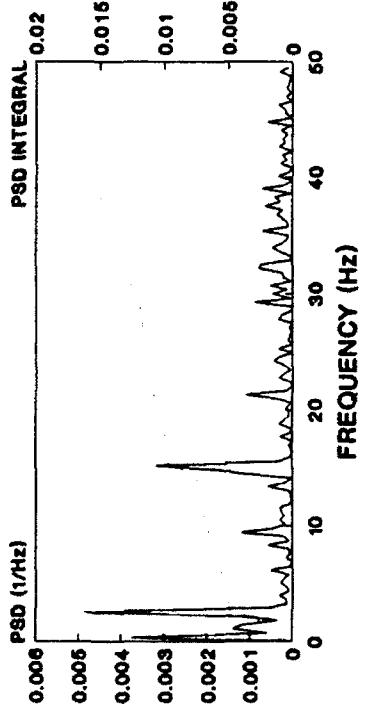
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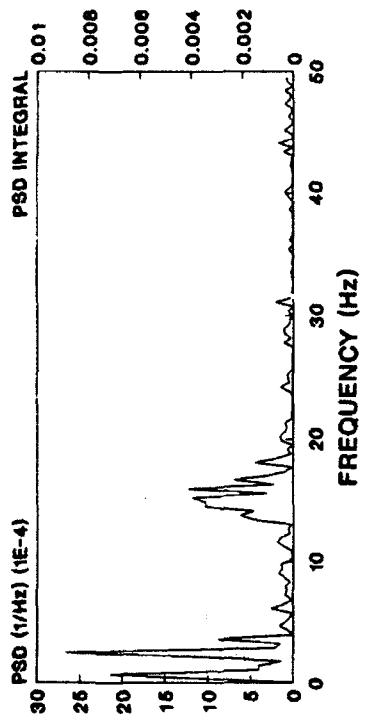
CUBE (R) - HT 8.8 - THETA 30 - AZ 090

— PSD — PSD INTEGRAL

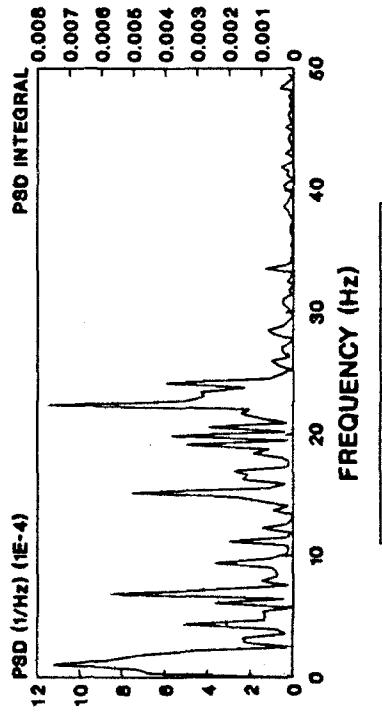
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



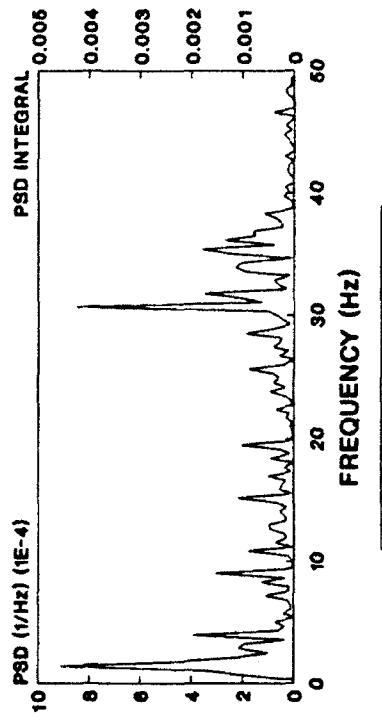
FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



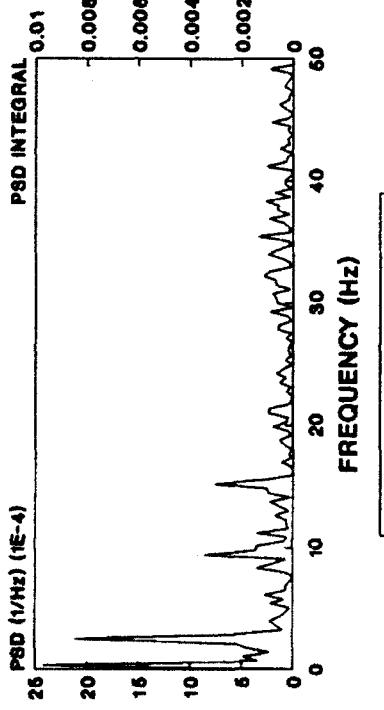
FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



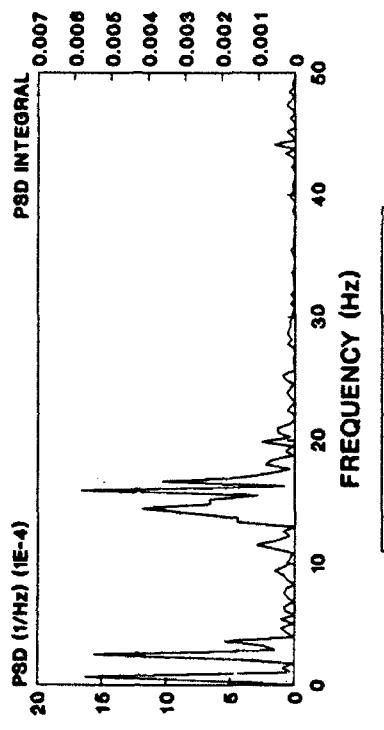
FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



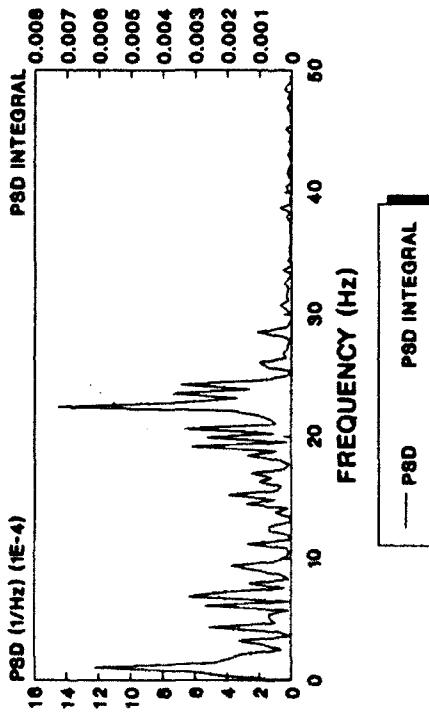
**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



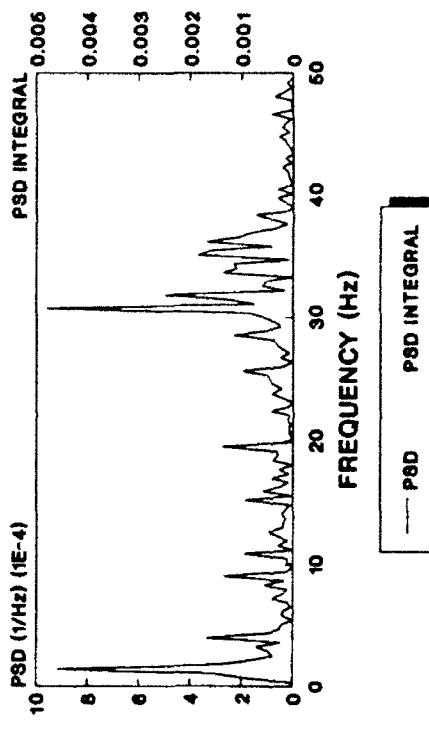
**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



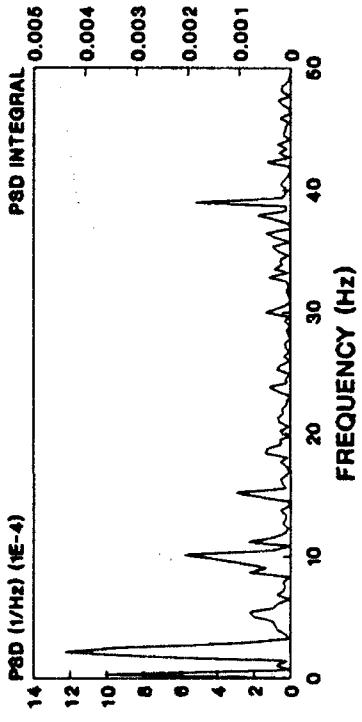
**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



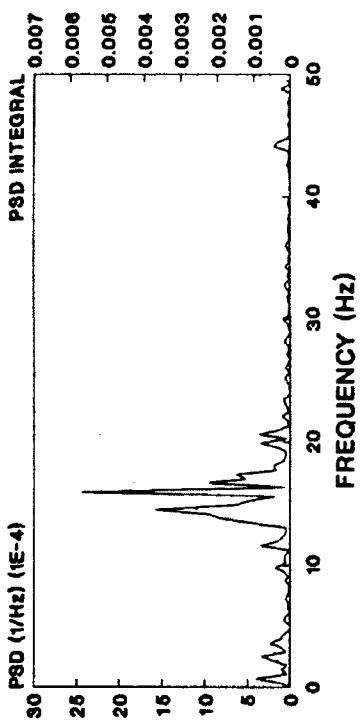
**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



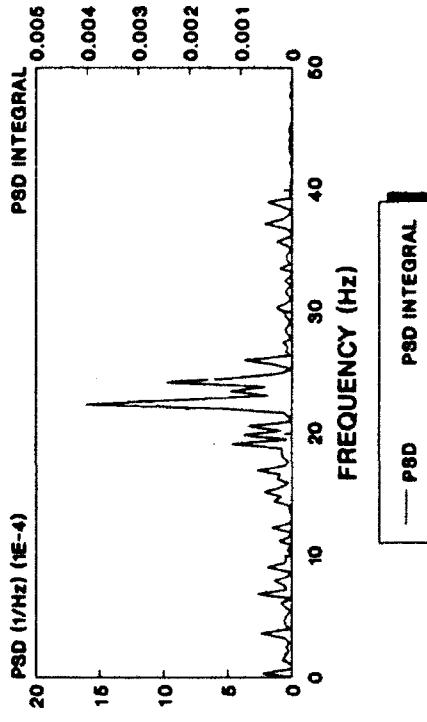
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



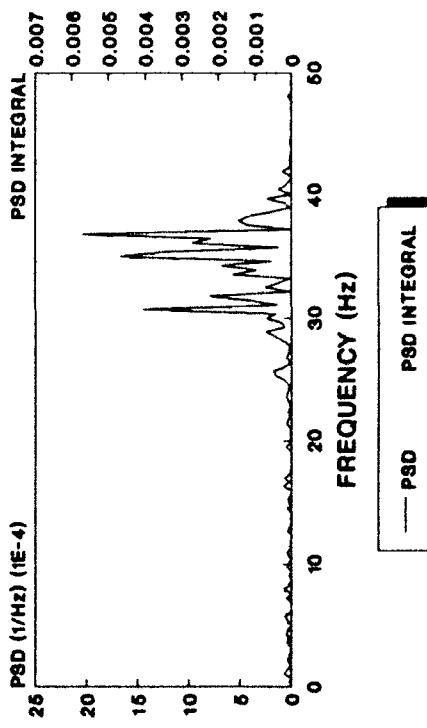
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



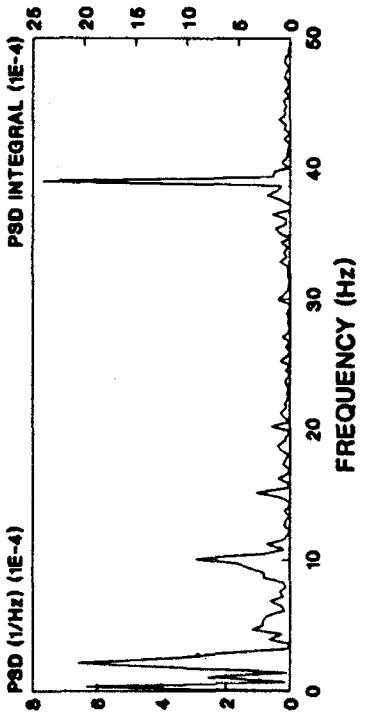
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



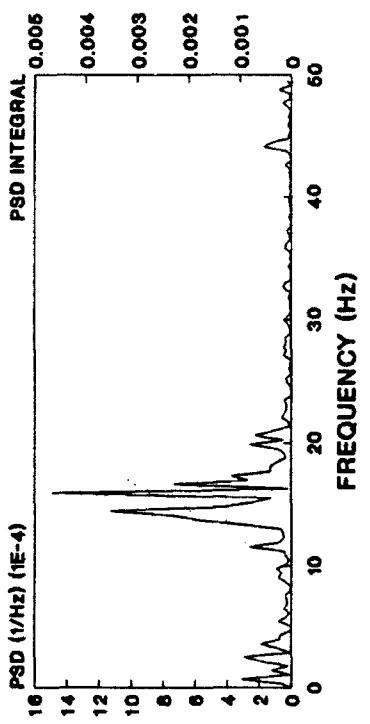
FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



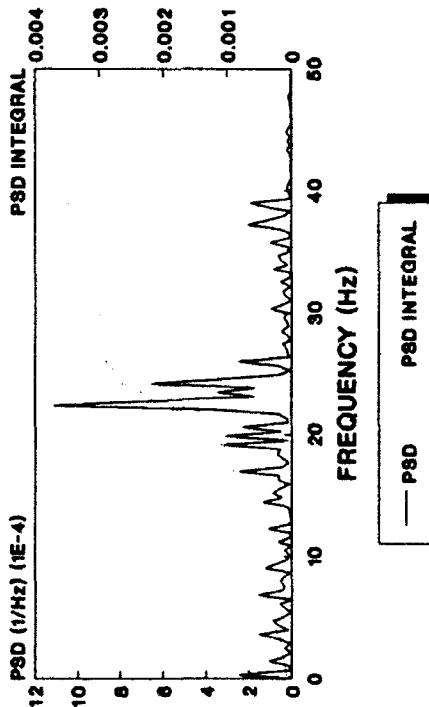
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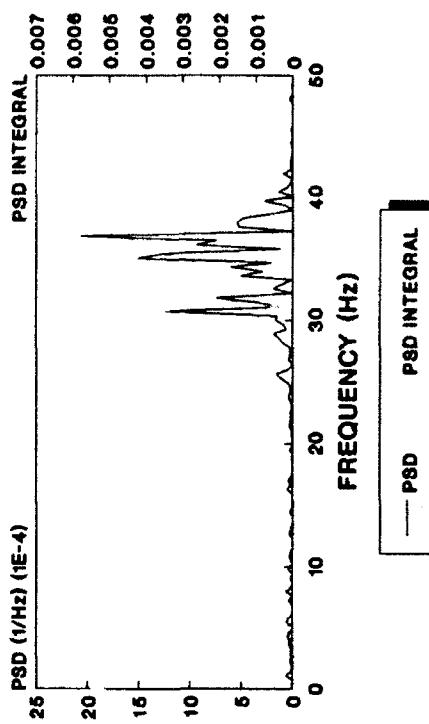
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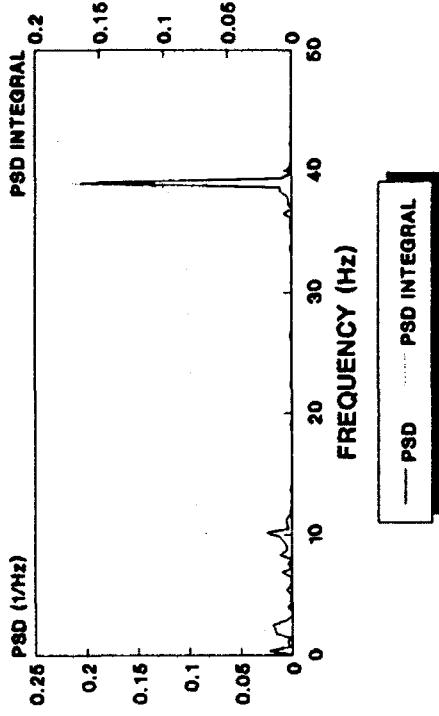
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL

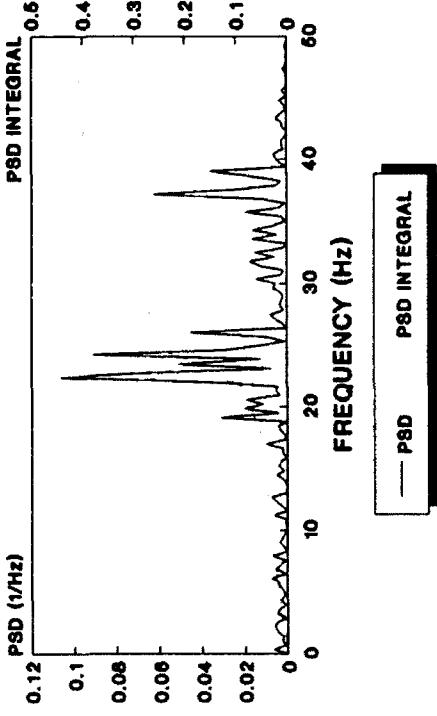


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



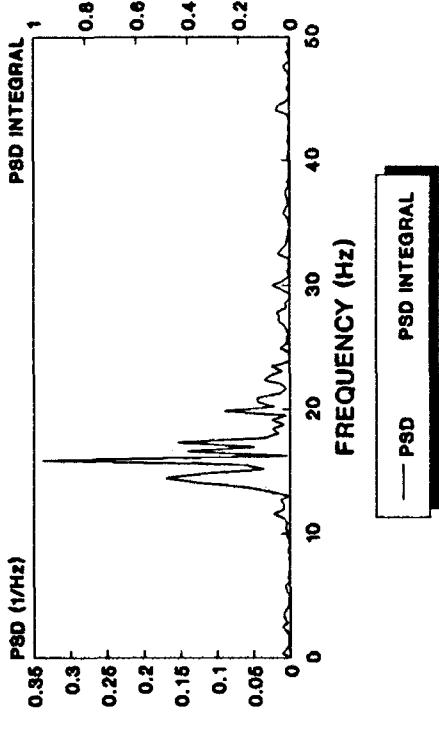
CUBE (R) - HT 8.0 - THETA 30 - AZ 120

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



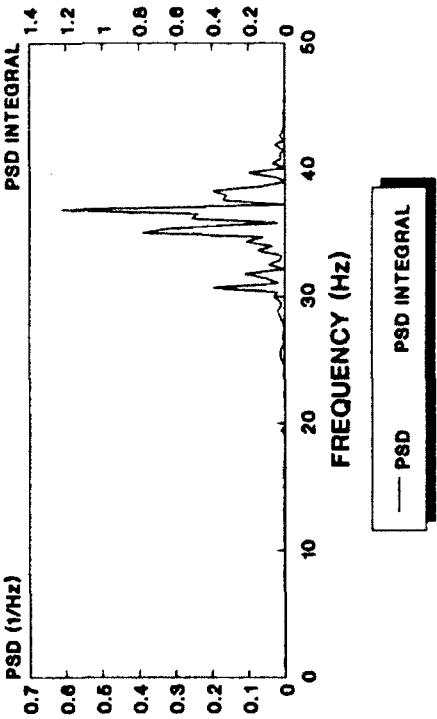
CUBE (R) - HT 8.0 - THETA 30 - AZ 120

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



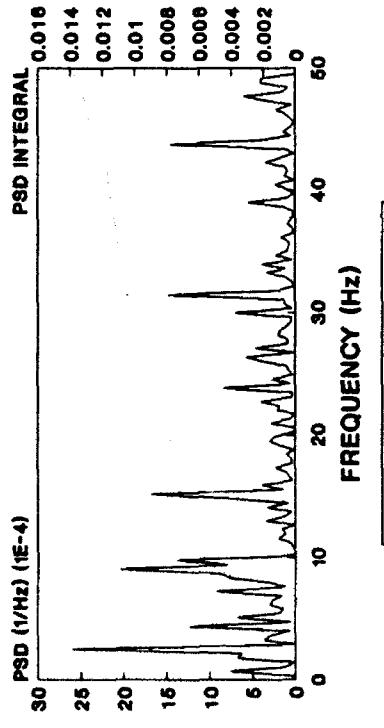
CUBE (R) - HT 8.0 - THETA 30 - AZ 120

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

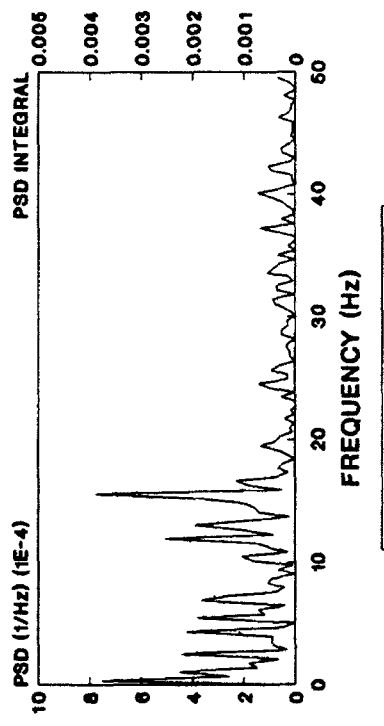


CUBE (R) - HT 8.0 - THETA 30 - AZ 120

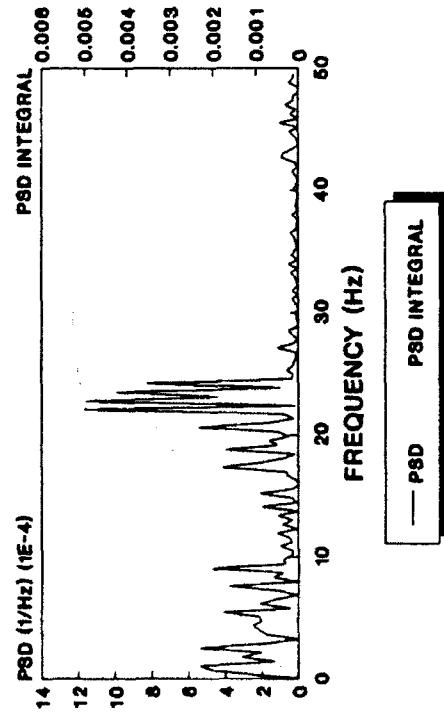
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



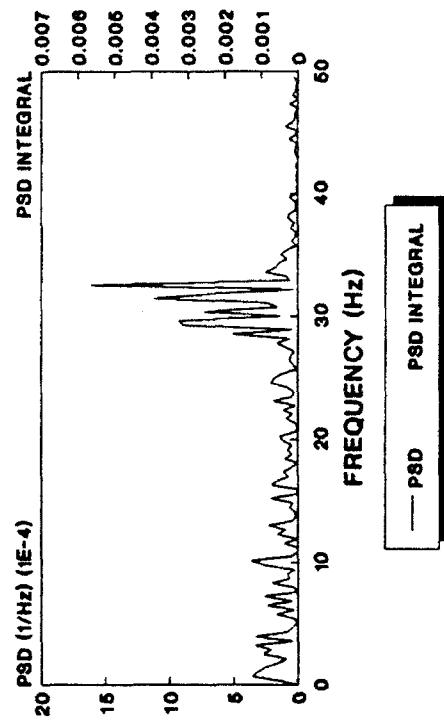
FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



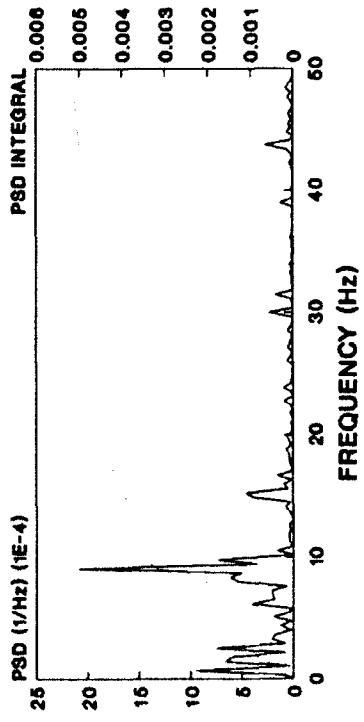
FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



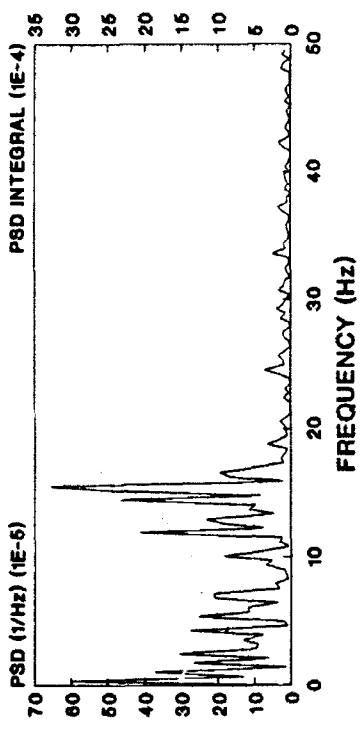
FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



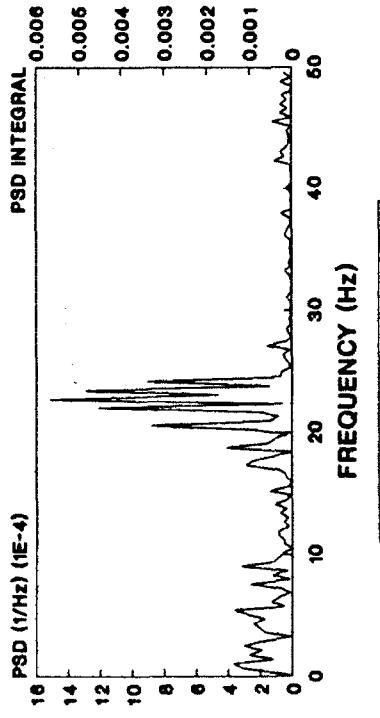
MOMENT COEFF - NORMAL 60 FT/SEC NOMINAL



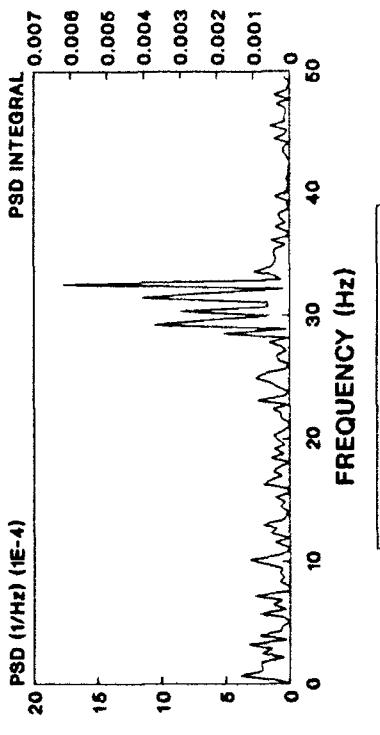
MOMENT COEFF - NORMAL 90 FT/SEC NOMINAL



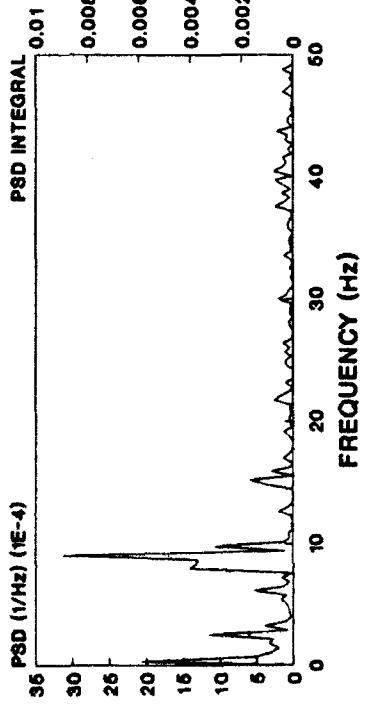
MOMENT COEFF - NORMAL 120 FT/SEC NOMINAL



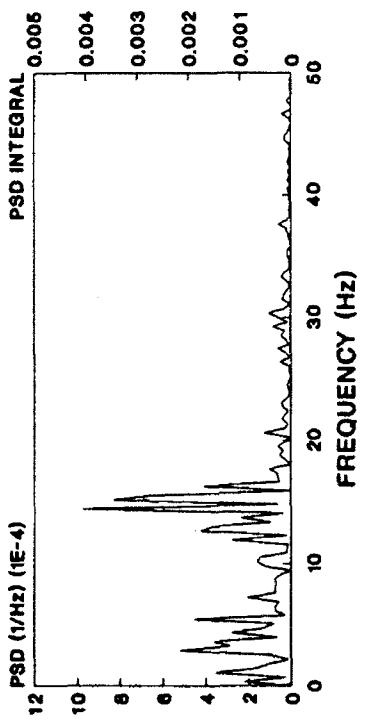
MOMENT COEFF - NORMAL 180 FT/SEC NOMINAL



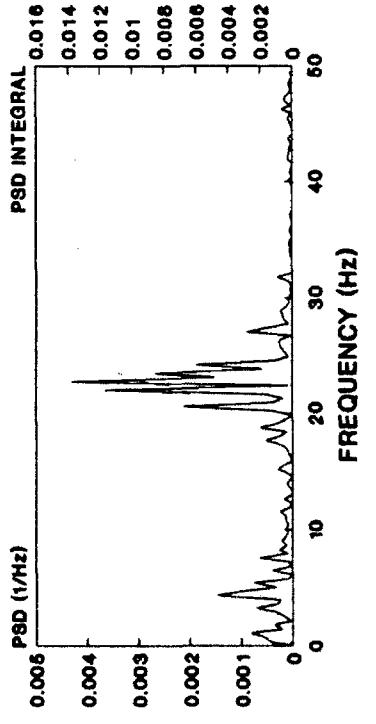
FORCE COEFF - LATERAL 60 FT/SEC NOMINAL



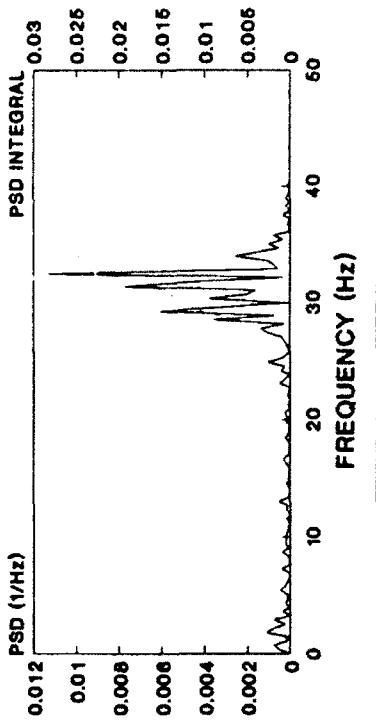
FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



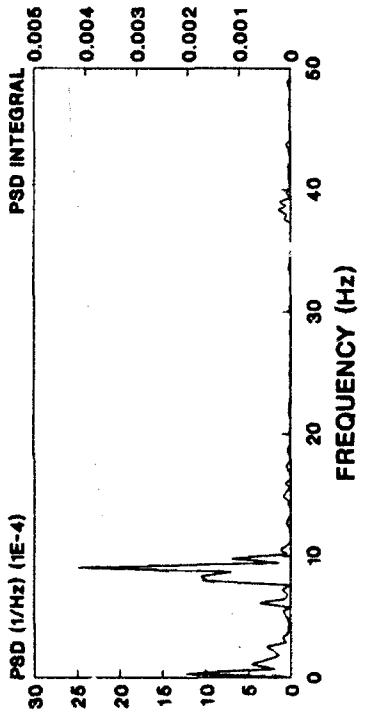
FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



FORCE COEFF - LATERAL 180 FT/SEC NOMINAL

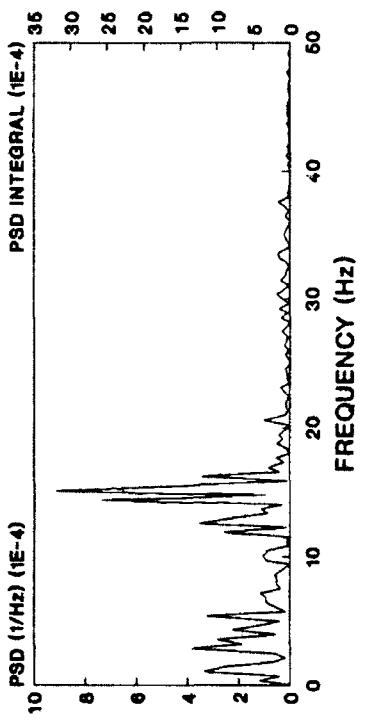


**MOMENT COEFF - LATERAL
60 FT/SEC NOMINAL**



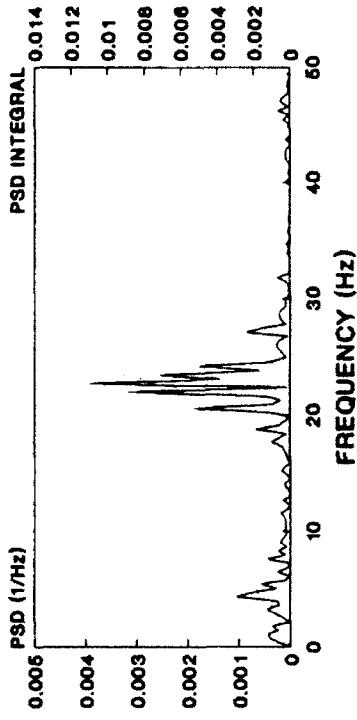
CUBE (R) - HT 6.0 - THETA 30 - AZ 136

**MOMENT COEFF - LATERAL
90 FT/SEC NOMINAL**



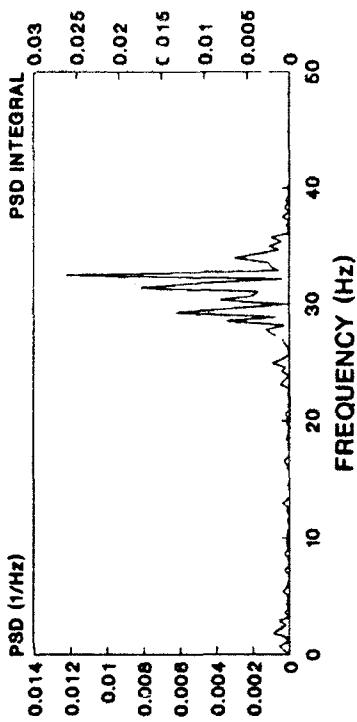
CUBE (R) - HT 6.0 - THETA 30 - AZ 136

**MOMENT COEFF - LATERAL
120 FT/SEC NOMINAL**



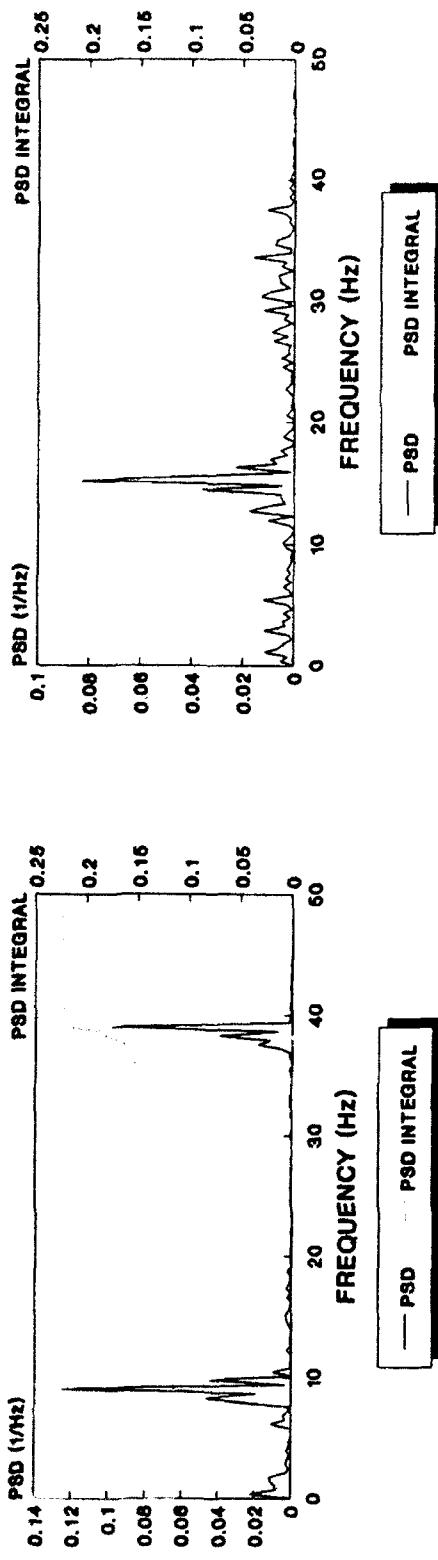
CUBE (R) - HT 6.0 - THETA 30 - AZ 136

**MOMENT COEFF - LATERAL
180 FT/SEC NOMINAL**



CUBE (R) - HT 6.0 - THETA 30 - AZ 136

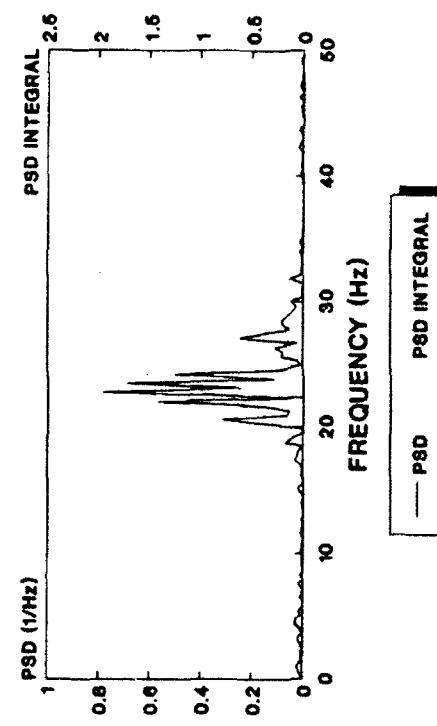
MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



MOMENT COEFF - ROLL 90 FT/SEC NOMINAL

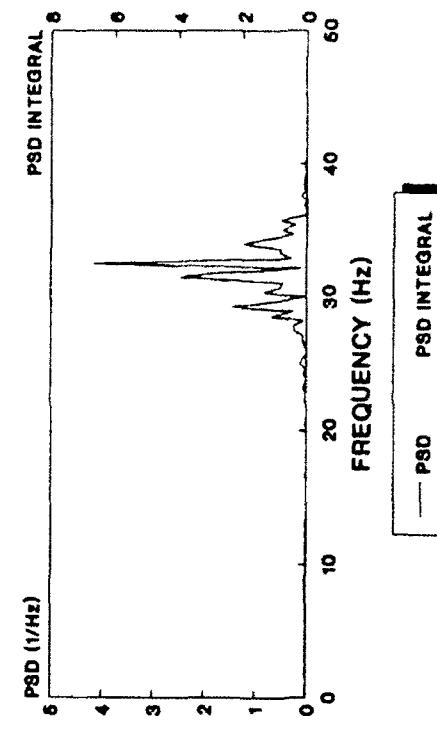
CUBE (R) - HT 0.0 - THETA 30 - AZ 136

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

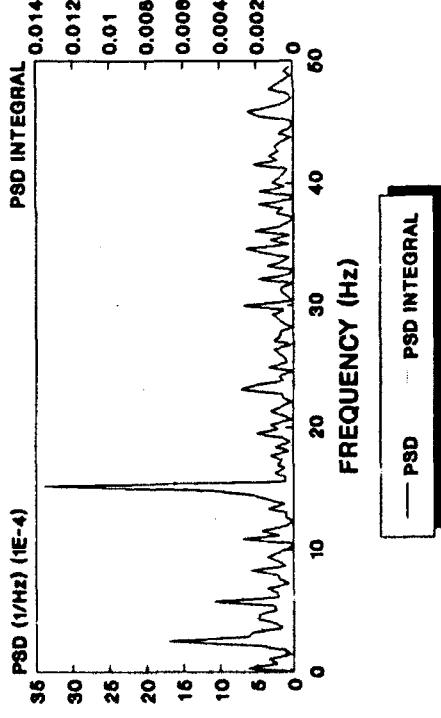
CUBE (R) - HT 0.0 - THETA 30 - AZ 136



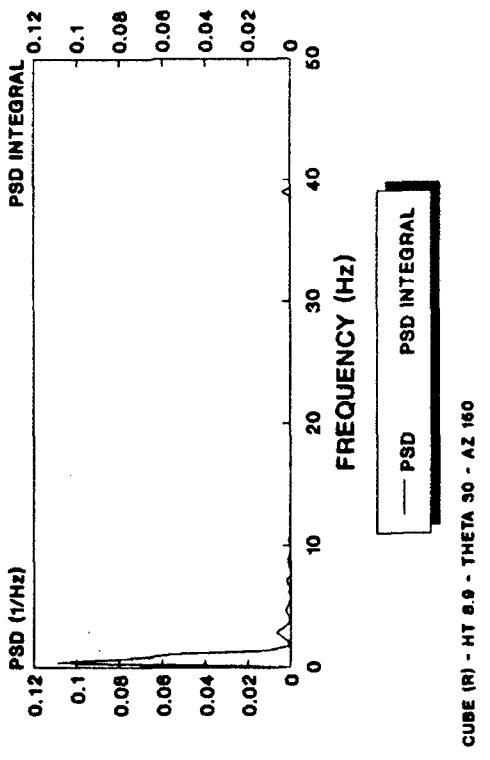
CUBE (R) - HT 0.0 - THETA 30 - AZ 136

CUBE (R) - HT 0.0 - THETA 30 - AZ 136

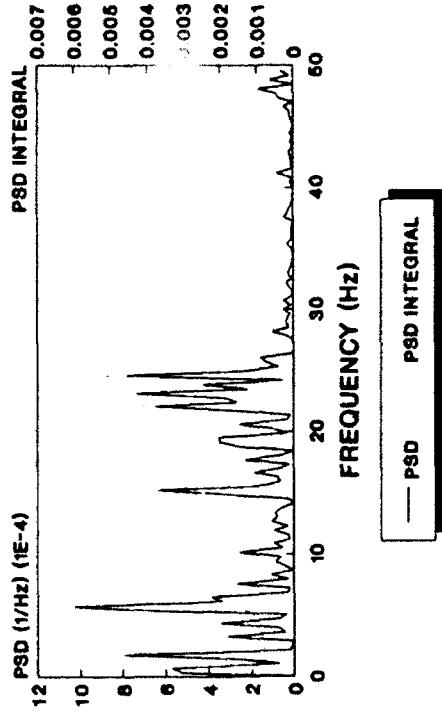
FORCE COEFF - NORMAL 60 FT/SEC NOMINAL



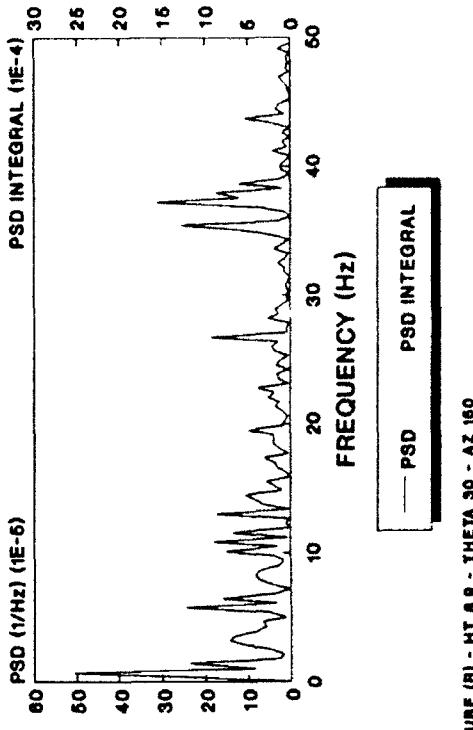
FORCE COEFF - NORMAL 90 FT/SEC NOMINAL



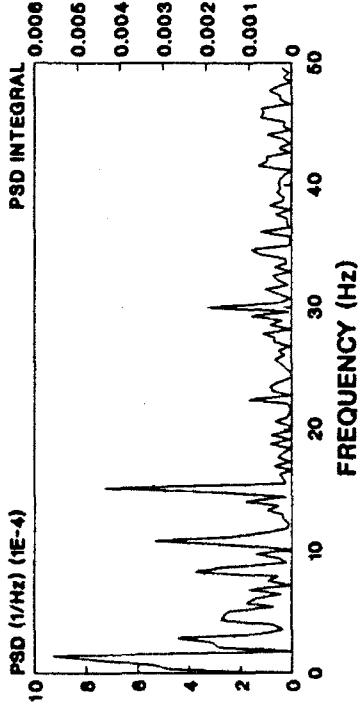
FORCE COEFF - NORMAL 120 FT/SEC NOMINAL



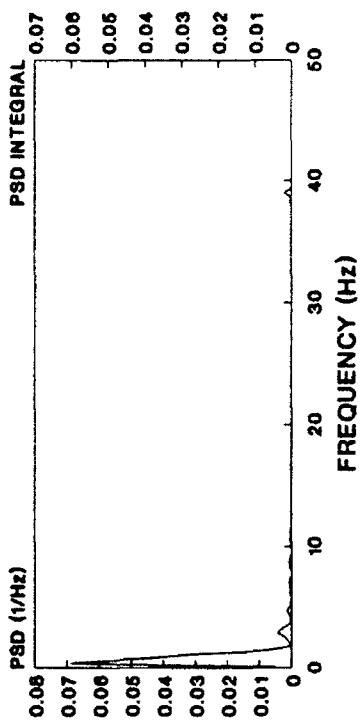
FORCE COEFF - NORMAL 180 FT/SEC NOMINAL



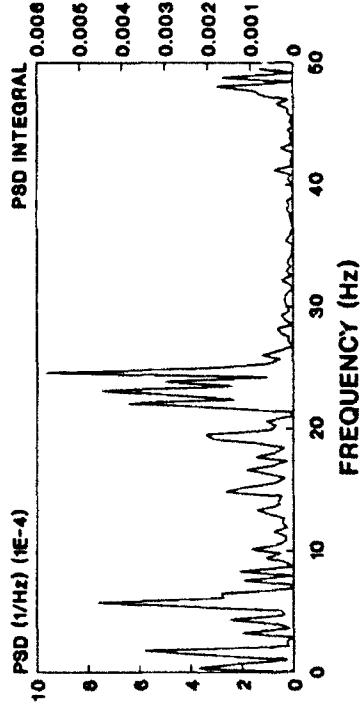
**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



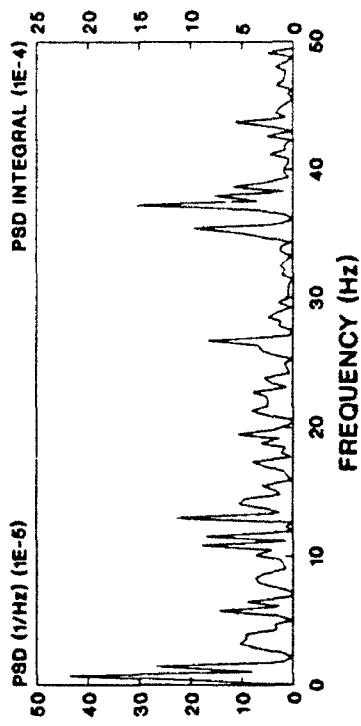
**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



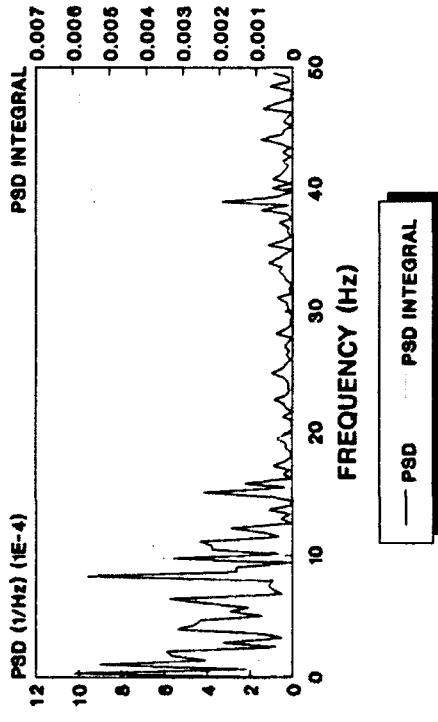
**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



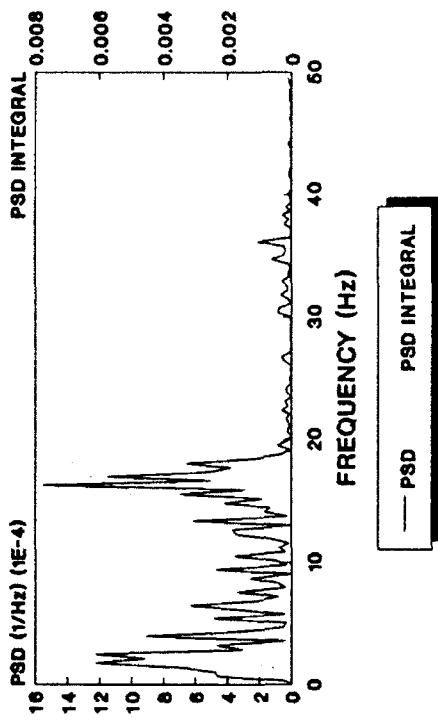
**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**



FORCE COEFF - LATERAL 60 FT/SEC NOMINAL

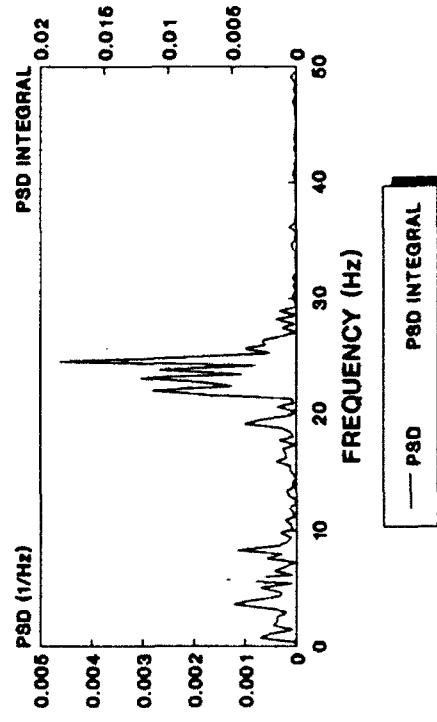


FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



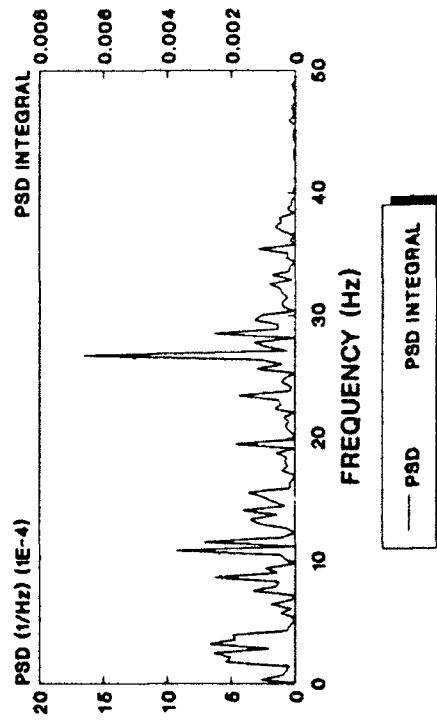
CUBE (R) - HT 6.0 - THETA 30 - AZ 180

FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



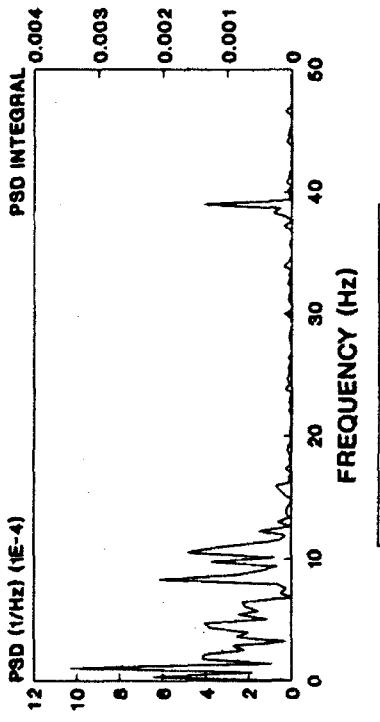
232

FORCE COEFF - LATERAL 180 FT/SEC NOMINAL

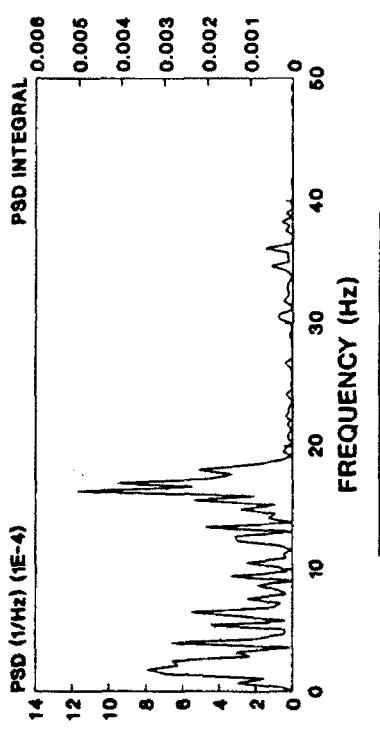


CUBE (R) - HT 6.0 - THETA 30 - AZ 180

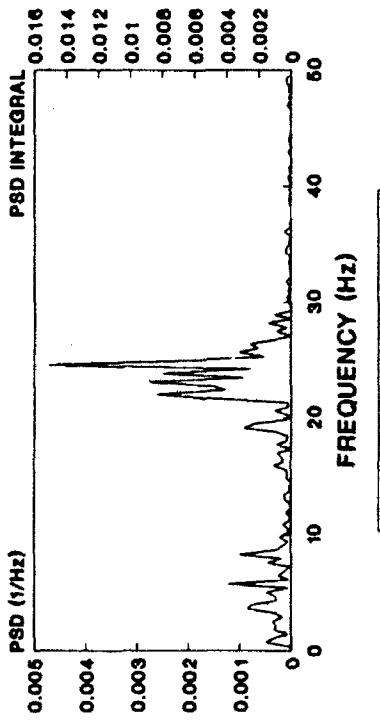
MOMENT COEFF - LATERAL 60 FT/SEC NOMINAL



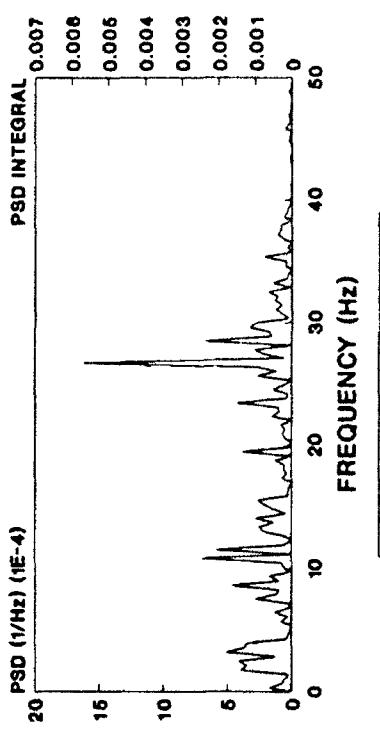
MOMENT COEFF - LATERAL 90 FT/SEC NOMINAL



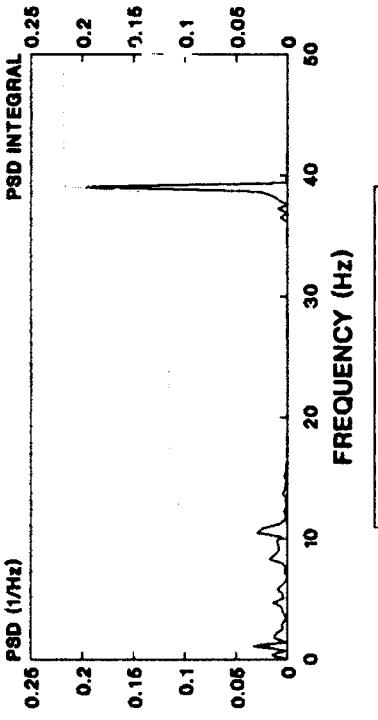
MOMENT COEFF - LATERAL 120 FT/SEC NOMINAL



MOMENT COEFF - LATERAL 180 FT/SEC NOMINAL

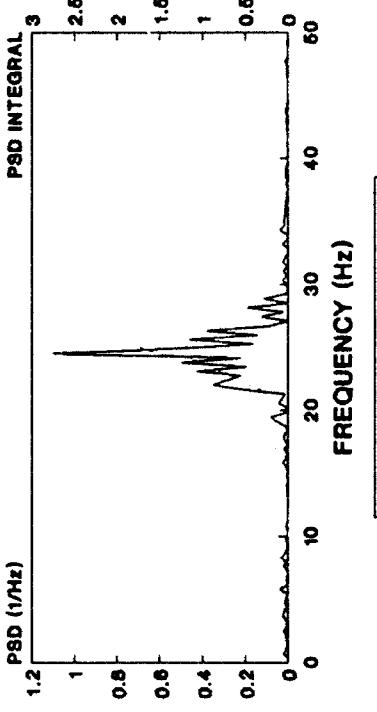


MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



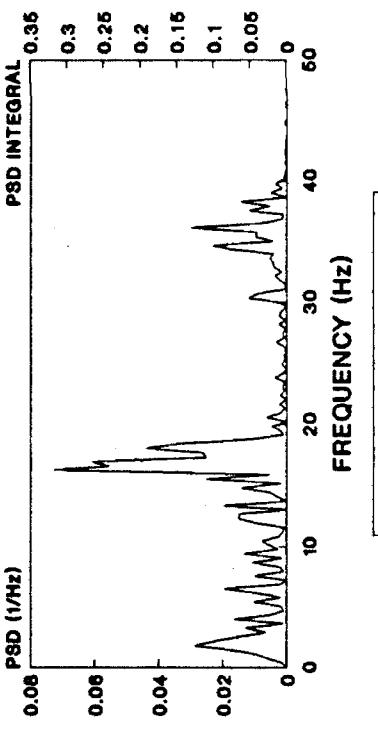
CUBE (R) - HT 6.0 - THETA 30 - AZ 160

MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



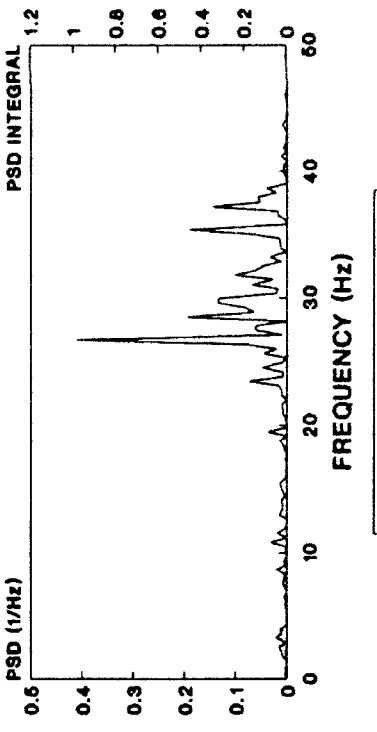
CUBE (R) - HT 6.0 - THETA 30 - AZ 160

MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



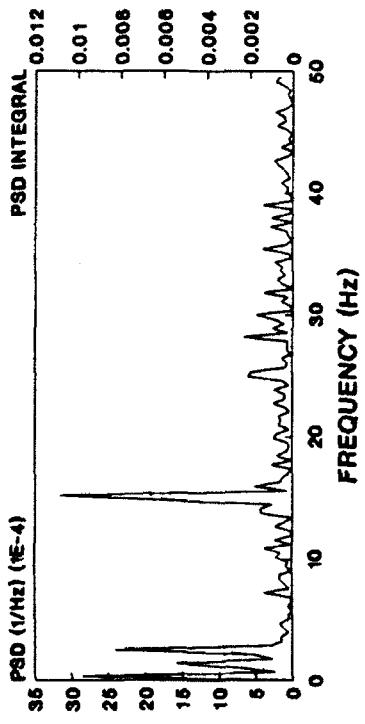
CUBE (R) - HT 6.0 - THETA 30 - AZ 160

MOMENT COEFF - ROLL 180 FT/SEC NOMINAL



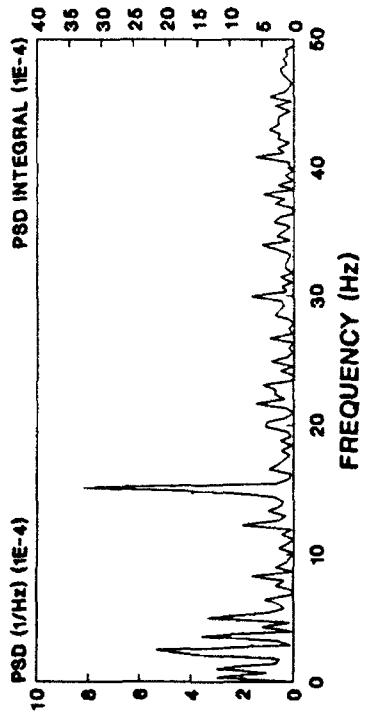
CUBE (R) - HT 6.0 - THETA 30 - AZ 160

**FORCE COEFF - NORMAL
60 FT/SEC NOMINAL**



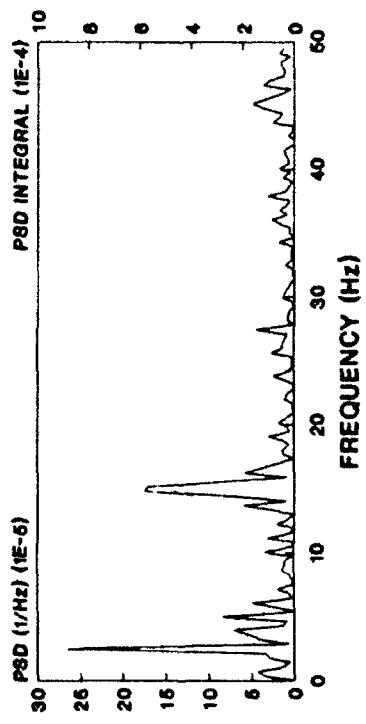
CUBE (R) - HT 0.0 - THETA 30 - AZ 180

**FORCE COEFF - NORMAL
90 FT/SEC NOMINAL**



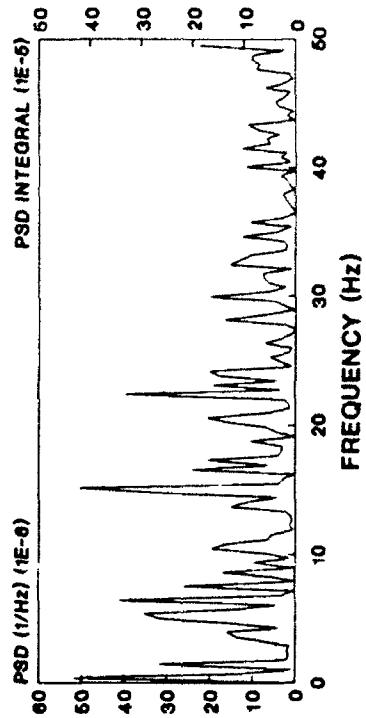
CUBE (R) - HT 0.9 - THETA 30 - AZ 180

FORCE COEFF - NORMAL
120 FT/SEC NOMINAL



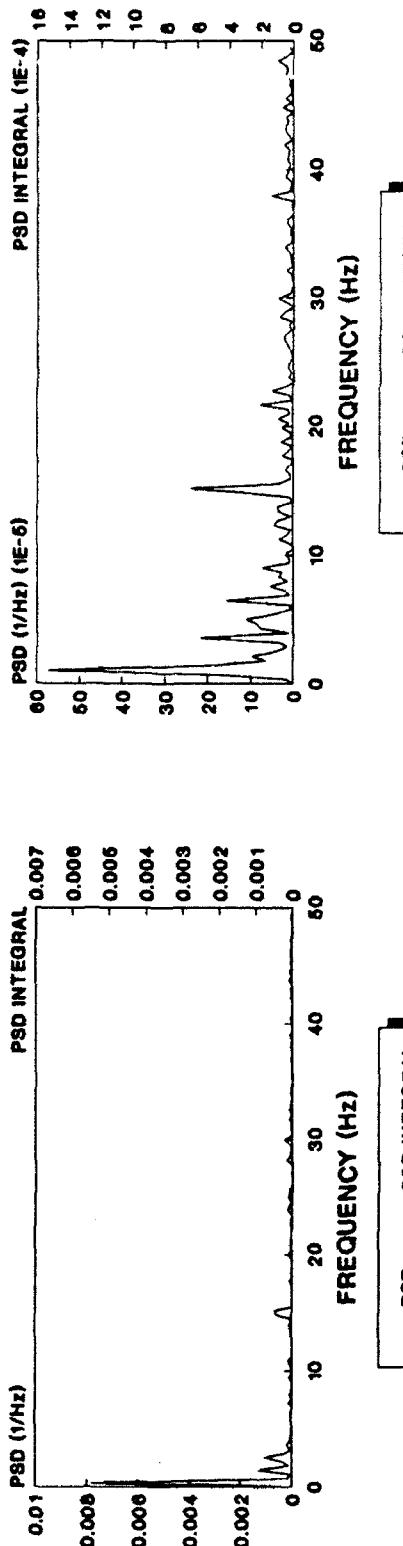
CUBE (R) - HT 0.0 - THETA 30 - AZ 180

FORCE COEFF - NORMAL
180 FT/SEC NOMINAL



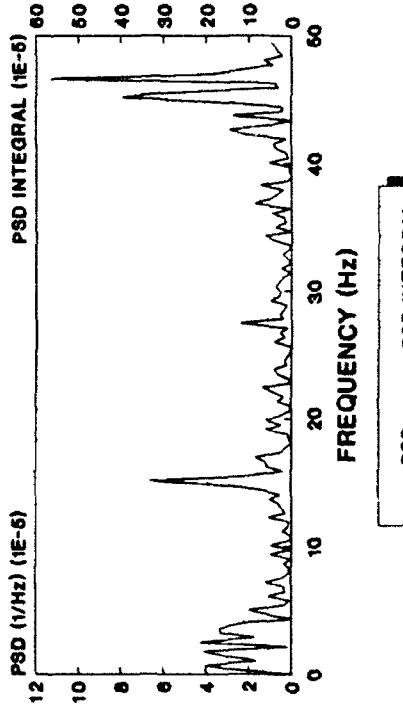
CUBE (R) - HT 8.0 - THETA 30 - A2 100

**MOMENT COEFF - NORMAL
60 FT/SEC NOMINAL**



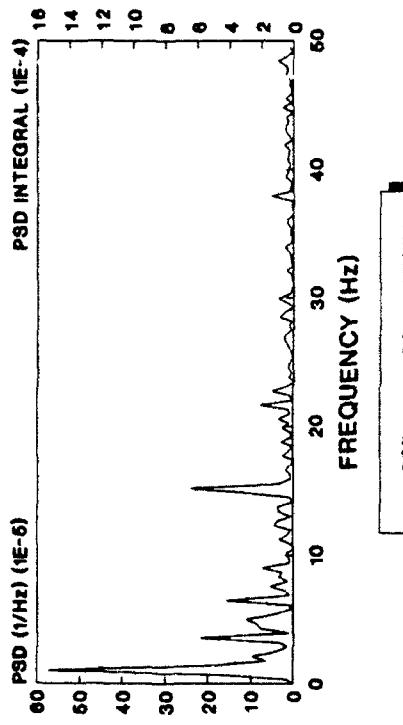
CUBE (R) - HT 6.9 - THETA 30 - AZ 180

**MOMENT COEFF - NORMAL
120 FT/SEC NOMINAL**



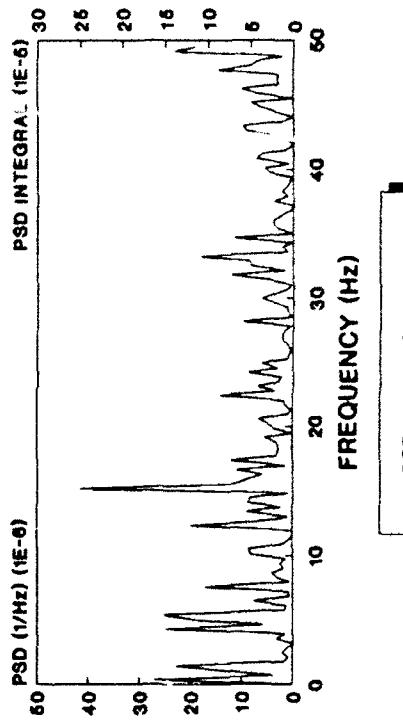
CUBE (R) - HT 6.9 - THETA 30 - AZ 180

**MOMENT COEFF - NORMAL
90 FT/SEC NOMINAL**



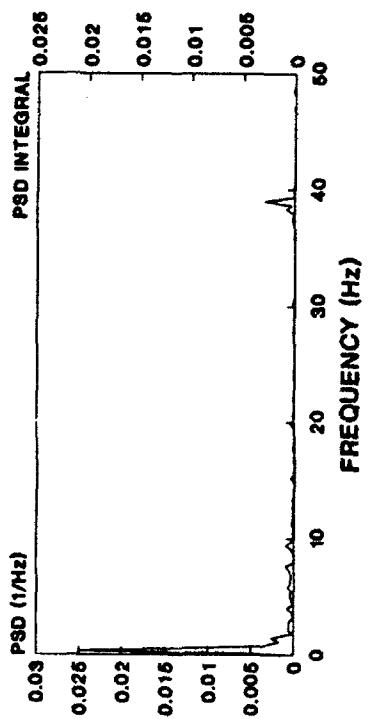
CUBE (R) - HT 6.9 - THETA 30 - AZ 180

**MOMENT COEFF - NORMAL
180 FT/SEC NOMINAL**

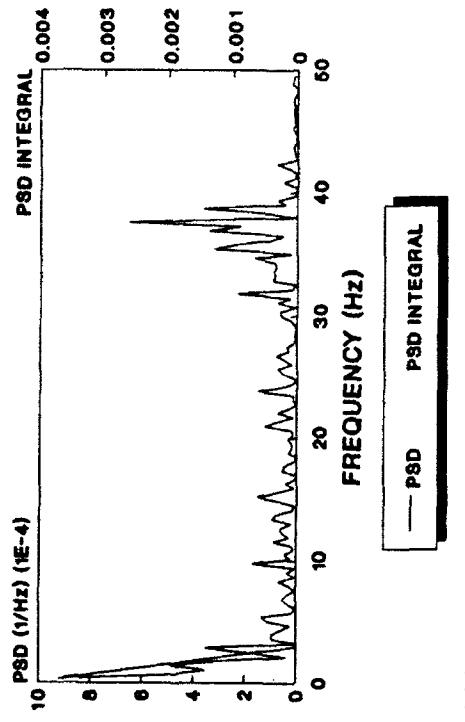


CUBE (R) - HT 6.9 - THETA 30 - AZ 180

FORCE COEFF - LATERAL 60 FT/SEC NOMINAL

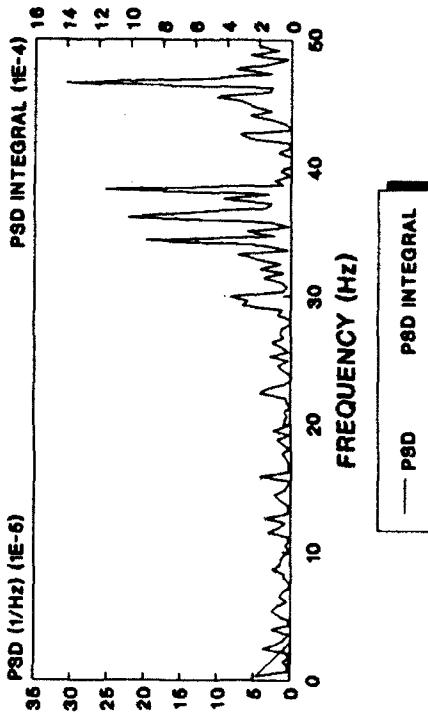


FORCE COEFF - LATERAL 90 FT/SEC NOMINAL



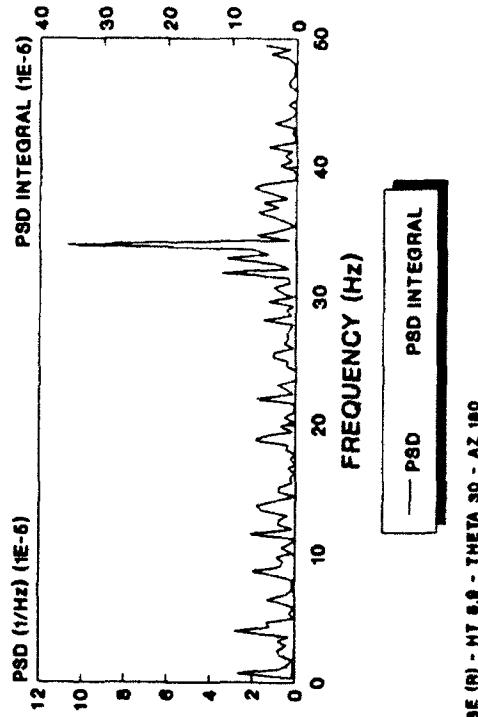
CUBE (R) - HT 0.0 - THETA 30 - AZ 180

FORCE COEFF - LATERAL 120 FT/SEC NOMINAL



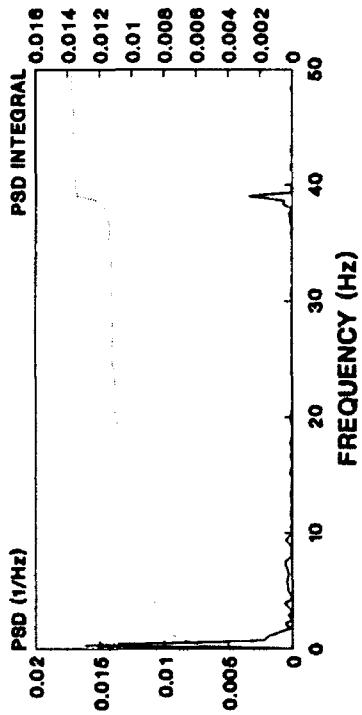
237

FORCE COEFF - LATERAL 180 FT/SEC NOMINAL



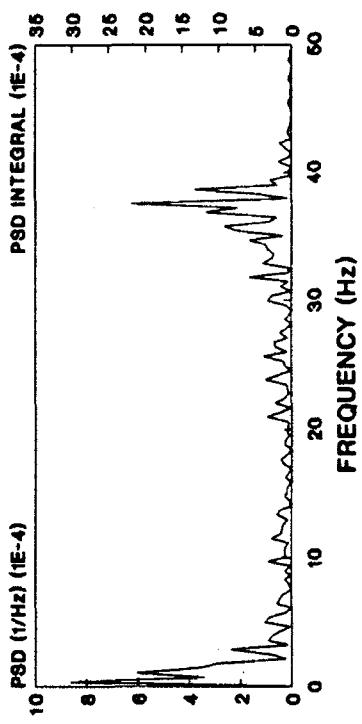
CUBE (R) - HT 0.0 - THETA 30 - AZ 180

**MOMENT COEFF - LATERAL
60 FT/SEC NOMINAL**



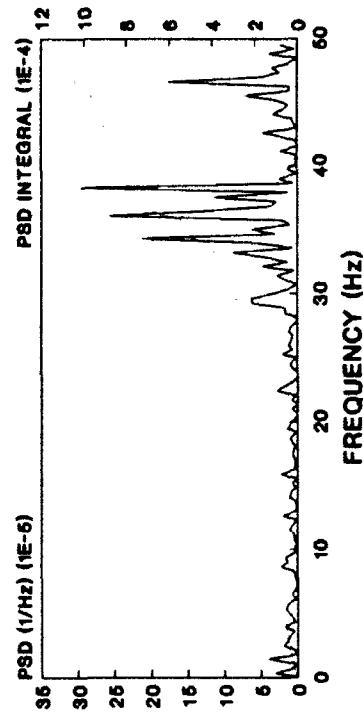
CUBE (R) - HT 6.0 - THETA 30 - AZ 180

**MOMENT COEFF - LATERAL
90 FT/SEC NOMINAL**



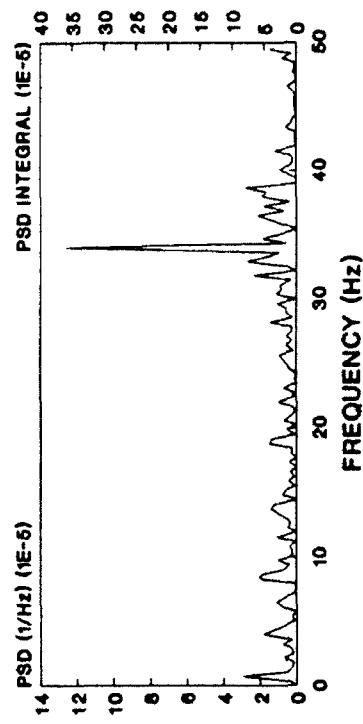
CUBE (R) - HT 6.0 - THETA 30 - AZ 180

**MOMENT COEFF - LATERAL
120 FT/SEC NOMINAL**



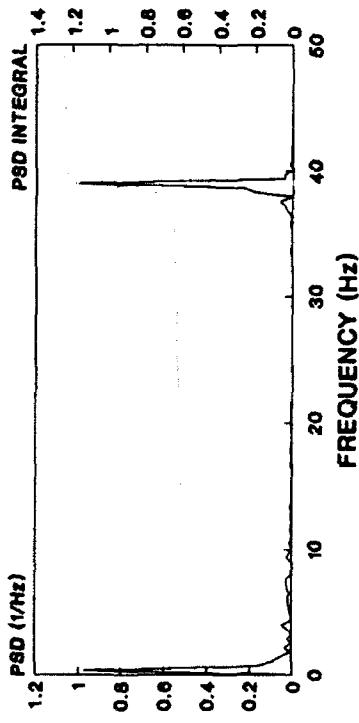
CUBE (R) - HT 6.0 - THETA 30 - AZ 180

**MOMENT COEFF - LATERAL
180 FT/SEC NOMINAL**

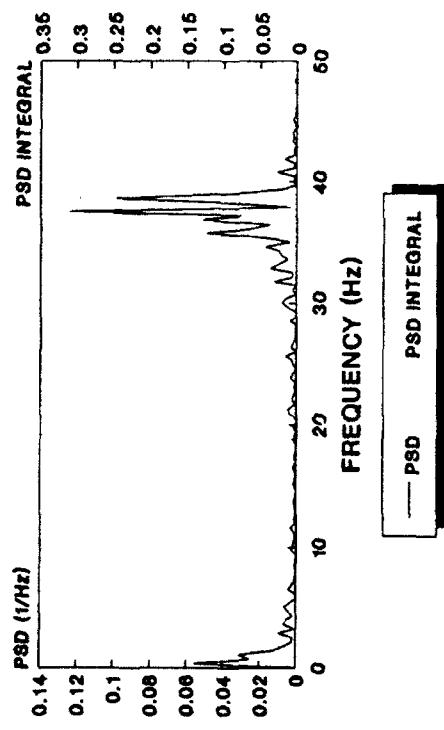


CUBE (R) - HT 6.0 - THETA 30 - AZ 180

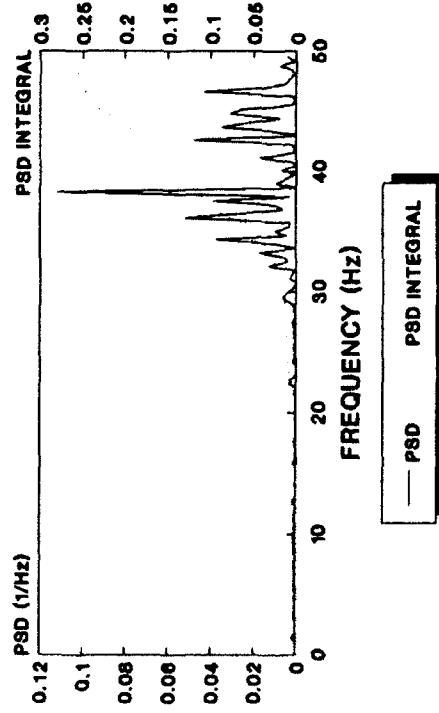
MOMENT COEFF - ROLL 60 FT/SEC NOMINAL



MOMENT COEFF - ROLL 90 FT/SEC NOMINAL



MOMENT COEFF - ROLL 120 FT/SEC NOMINAL



MOMENT COEFF - ROLL 180 FT/SEC NOMINAL

